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CONTENT

India's Commitment towards Global Vision: Universal Health Coverage

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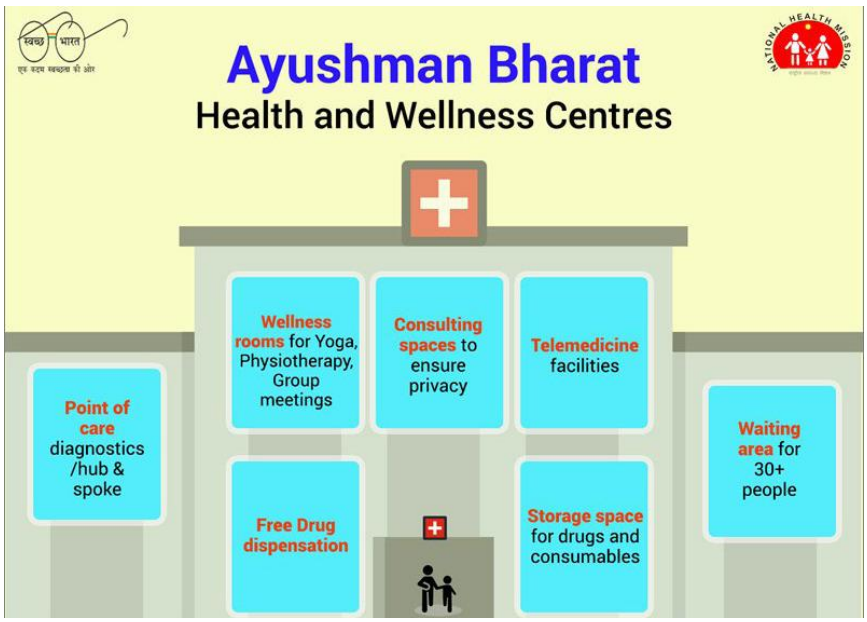
What if everyone had access to the quality health services they need? What if people weren't pushed into poverty by paying for the health care services? This could be truly achieved if concrete efforts are made to assure that everyone, everywhere can access essential quality health services without facing any financial hardship. To draw the attention towards the importance of global health, WHO has adopted this year's theme as – "Universal health coverage: everyone, everywhere". UHC has mainly 3 components: the population covered, the range of services made available; and the extent of financial protection from the costs of health services.[1]

Fifty percent of World's population is yet to get full coverage of essential health services. Around 800 million people (12% of world's population), spent at least 10% of their household budgets to pay for health care services. Thus, by protecting people from paying from their own pockets reduces the risk of pushing people into poverty and provides the basis for long-term economic development. All UN member states have agreed to try to achieve goals of the theme by 2030, as a part of the sustainable development goals.[2]

India spends 4.5 per cent of its Gross Domestic Product (GDP) on health which is less than half the global average of 10% of GDP. However, public spending at just 1.4% of GDP, accounts for only one-third of total health expenditure – significantly lower than the global average of 6% of GDP. Around 22% of 1.3 billion people in India are below poverty line. [3] The low government financing of health pushes the costs to its citizens forcing them to meet healthcare costs Out Of Pockets (OOP). In the year 2014, OOP expenditure as a proportion of total health expenditure was very high in India (62.8 %) as compared to the global average of 18.6%.[4]

Though 68.8% population live in rural areas, estimated 80% of hospital beds and health care providers are in urban areas. The public sector provides an estimated 20% of outpatient and 40% of hospitalization services.[5]



India has made considerable progress in public health since independence. Many states have reported significant improvements in key health indicators like institutional deliveries, full immunization, availability of diagnostic, family welfare services and disease control programs etc. as a result of various reforms being implemented under NRHM. Despite India facing many challenges in health system, it continues to make efforts towards universal coverage.

To achieve Universal health coverage in India, high level expert group report recommends: increase public

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expenditures on health to at least 2.5% by the end of the 12th five year plan, and to at least 3% of GDP by 2022; ensure availability of free essential medicines; general taxation as the principal source of health care financing; focus on primary health care & strengthening of district hospital; 70% of health care expenditure on primary health care; integration of all government funded insurance schemes with the UHC system; ensure adherence to quality assurance standards and others. [6]

"Ayushman Bharat" is a centrally sponsored National health protection scheme launched by Honorable Prime Minister Shri Narendra Modi on 14th April, 2018 and is to be the world's largest government funded health care program. It will cover over 10.74 crore poor and vulnerable families by providing coverage up to Rs. 5 lakhs per family for secondary and tertiary care hospitalization.[7] One of the important steps in this scheme is to reach the maximum population through Health and Wellness Centre, whose importance is also envisioned in National Health Policy 2017. Under this scheme, 1.5 lakh Health and Wellness Centre are planned to bring the health care system closer to the doors of the people. These centers will provide comprehensive health care which includes, non-communicable diseases, maternal and child health services, free essential drugs and diagnostic services. The provisions under Ayushman Bharat could move India closer to the goal of universal health coverage and build Swasth Bharat. With this implementation, 40% of the underprivileged population will have access to secondary and tertiary level institutions. [7]

However, UHC can be achieved if health system is more people centered, strong and efficient, services are more affordable and available to all through well trained and motivated workers and easily available.

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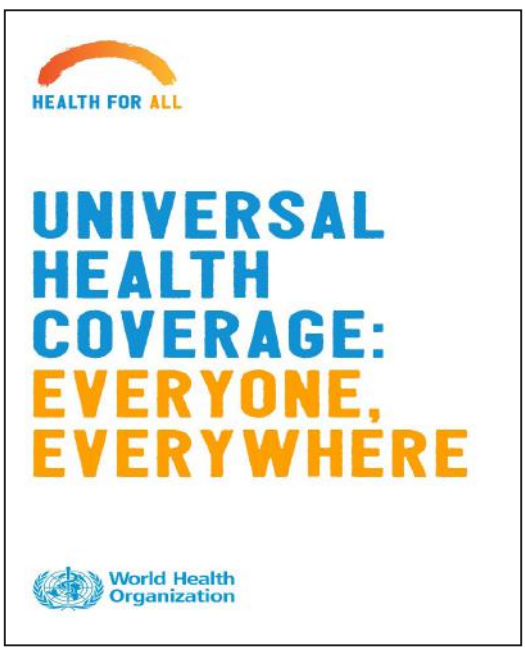

REVIEW ARTICLE

Management of Febrile Seizure and Differentiating it from Epilepsy: A Short Review

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Abstract

Febrile seizure is the most common seizures seen in infancy and pre-school era. They are mostly benign in nature. There are two categories of febrile seizures, simple and complex. Both the International League against Epilepsy and the American academy of paediatrics have published definitions on the classification of febrile seizures. Simple febrile seizures are mostly benign, but a prolonged (complex) febrile seizure can have long term consequences. Most children who have a febrile seizure have normal health and development after the event, but recent evidence suggests a small subset of children presenting with seizures and fever may have recurrent seizure or develop epilepsy. Diagnosis is solely clinical. But other causes of fever and seizure must be ruled out. Electroencephalogram, lumbar puncture and neuroimaging, all are to be used for specific indications but not routinely. Treatment consists of acute management and prophylaxis for further attack. This review will give an overview of the definition of febrile seizures, epidemiology, evaluation, treatment, outcomes and recent research.

Key words: febrile seizure, clobazam, prophylaxis, epilepsy

Introduction

Febrile seizure is defined as seizures that occur between the age of 6 and 60 months with a temperature of 38°C (100.4°F) or higher, which are not the result of central nervous system infection or any metabolic imbalance, and that occur in the absence of a history of prior afebrile seizures[1](American academy of paediatrics definition). Febrile seizures (FS) are the single most common seizure type and occur in 2 to 5% of children younger than age 5 years with a peak incidence in the second year of life.[2] FS are considered benign, but a small subset of children presenting with seizures and fever may have recurrent FS or develop epilepsy. The incidence and prevalence of FS is similar across the world with some geographic variations such as higher prevalence in Japan and Guam.[3] According to some Indian studies, febrile seizures occur in 3-4% of children under the age of 5 years. Usually, they do not occur beyond the age of 5 years implying a specific vulnerability of young children to fever as a precipitant. The median age of occurrence is 18-22 months.[4] FS are not considered a form of epilepsy, but a FS can be the first presentation of subsequent epilepsy. Febrile seizure is a very common disease in under 5 children. Largely it can be managed in primary care settings. This article will help primary care physicians in diagnosing febrile seizure at the earliest and better management of the disease which will prevent unnecessary admission and referral. It will help in better counseling to decrease severe stress in parents.

Spectrum of febrile seizures

Febrile seizure can present in different forms starting from simple seizure with fever to generalised epilepsy form. The details of the spectrum are described in Box No-1.

Box-1: Spectrum of febrile seizures

- **Simple febrile seizure[1,5]**

  Simple febrile seizure is a primary generalized, usually tonic–clonic attack associated with fever, lasting for a maximum of 15 min, and not recurrent within a 24-hr period.

- **Complex febrile seizure[5]**

  Complex febrile seizure is more prolonged (>15 min), is focal, and/or reoccurs within 24 hr and/or associated with postictal neurologic abnormalities, more frequently a postictal palsy (Todd's palsy), or with previous neurologic deficits.

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- **Febrile Infection Related Epilepsy Syndrome (FIRES)[6]**

  This syndrome constitutes another emerging disease entity that is closely related to FS and epilepsy. Seizures are quite explosive, prolonged, and lifelong beginning from focal to generalised. Many patients develop a number of neurological symptoms over time.

- **Afebrile Febrile Seizures (AFS)[7]**

  This disorder refers to children who have provoked seizures lacking objective evidence of fever at the seizure onset but have definitive symptoms and signs of minor infection. The presenting illness is usually a mild respiratory or gastrointestinal infection.

- **Febrile status epilepticus[1]**

  Febrile status epilepticus is a febrile seizure lasting longer than 30 min. This operational definition has been revised. More recent articles and studies have advocated that the duration of paediatric status epilepticus should be operationally shortened to seizures lasting more than 5–10 minutes.[8]

- **Vaccinations-Related FS[9]**

  Vaccine encephalopathy or febrile seizures after vaccination are recently diagnosed as Dravet syndrome variant.

Epilepsy syndromes typically start with febrile seizures

- **Generalized epilepsy with febrile seizures plus (GEFS+)[1,10]:** Multiple febrile seizures and by several subsequent types of afebrile generalized seizures with variable degrees of severity. Autosomal dominant channelopathy.

- **Dravet syndrome[1,11]:** most severe of the spectrum of febrile seizure-associated epilepsies. More prolonged and more frequent seizures. During the 2nd yr of life, myoclonus, atypical absences, and partial seizures occur frequently and developmental delay usually follows. Autosomal dominant manner. The mutated gene is located on 2q24-31 and encodes for SCN1A.

Diagnosis approach

A child in FS age group having fever followed by seizure (one or multiple episode) can be diagnosed as febrile seizure after ruling out other clinical features like altered sensorium, toxic look, severe irritability, features of increased cranial pressure, meningeal signs etc.

Box-2: Risk factors[1,12]

MAJOR
Age <1 yr
Duration of fever <24 hr
Fever 38-39°C (100.4-102.2°F)

MINOR
Family history of febrile seizures
Family history of epilepsy
Complex febrile seizure
Day-care
Male gender
Lower serum sodium at time of presentation

Largely FS is a benign disease. But in future it can land up in epilepsy. Syndromic febrile seizure like Dravet syndrome has maximum chance of conversion into epilepsy in future

Table-1: Spectrum of febrile seizure and chance of epilepsy[1,13]

Spectrum of FS	Subsequent chance of epilepsy
Simple febrile seizure -	1%
Recurrent febrile seizures-	4%
Complex febrile seizures -	6%
Afebrile febrile seizure –	7.5%
Fever <1 hr before febrile seizure -	11%
Family history of epilepsy -	18%
Complex febrile seizures (focal) -	29%
Neurodevelopmental abnormalities-	33%

Any patient of suspected febrile seizure should be evaluated with proper history and risk factors. Approach guidelines are given in the following algorithm. (Box 3)

Investigations

Blood analysis: The American Academy of Paediatrics (AAP) has guidelines for evaluation of first simple febrile seizure, and state that clinicians should work to identify the source of the fever when a child presents within 12 hours of a simple febrile seizure.[15] Each child who presents with a febrile seizure requires a detailed history and a thorough general and neurologic examination. Febrile seizures often occur in the context of otitis media, roseola and human herpesvirus (HHV) 6 infection, shigella, or similar infections, making the evaluation more demanding. In patients with febrile status, HHV-6B (more frequently) and HHV-7 infections were found to account for one-third of the cases.[1,16,17,18] Several laboratory studies need

Box 3: Approach to a patient of suspected Febrile Seizure[14]
• History • Examination and rule out other conditions like meningitis, encephalitis, cerebral malaria etc • Manage acute febrile seizure and acute illness. • Determine risk factors for recurrence and estimate risk of Recurrence of the febrile seizures (Box-2)
Counsel parents about risk of recurrence and how to provide first aid and manage fever. Determine risk factors for later epilepsy (table-1)
Low risk No therapy or investigations are necessary **Intermediate or high risk** 1. Consider electroencephalography and neuroimaging 2. Consider intermittent oral diazepam or, in exceptional cases that recur, continuous therapy

to be considered in evaluating the patient with febrile seizures. It is not recommended to perform routine serum investigations when a child has a simple febrile seizure.[16] The investigations that are performed should be based on the clinical presentation of the febrile illness.

Lumbar puncture: The AAP guidelines strongly recommend a lumbar puncture in any child who presents with a seizure, a fever and has meningeal signs and symptoms. It is also recommended in any child whose history or examination suggests the presence of meningitis or intracranial infection.[15] Meningitis should be considered in the differential diagnosis, and lumbar puncture should be performed for all infants younger than 6 months of age who present with fever and seizure, or if the child is ill appearing or at any age if there are clinical signs or symptoms of concern. A lumbar puncture is an option in a child 6-12 month of age who is deficient in Haemophilus influenzae type b and Streptococcus pneumonia immunizations or for whom immunization status is unknown. In patients presenting with febrile status epilepticus in the absence of a central nervous system infection, a nontraumatic lumbar puncture rarely shows cerebrospinal fluid (CSF) pleocytosis (96% have <3 nucleated cells in the CSF) and the CSF protein and glucose are usually normal.[1]

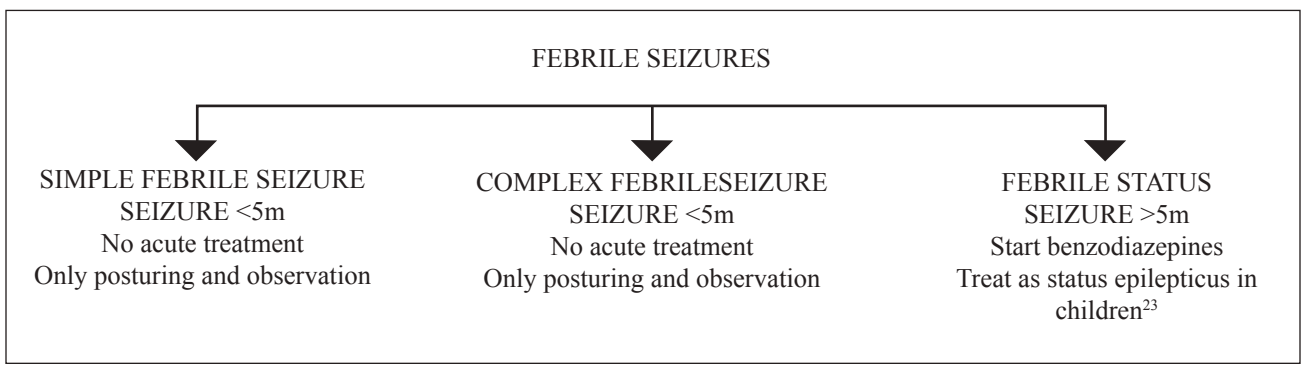
Neuroimaging: Neuroimaging is not recommended after a simple febrile seizure.[16] If a patient presents with focal complex FS and/or FSE, one should consider performing brain MRI to evaluate for a structural abnormality as an explanation for the seizure.[18] When MRI is unavailable computed tomography can be performed. According to consequence of prolonged febrile seizure (FEBSTAT study), imaging showed that developmental abnormalities of the hippocampus were more common in the febrile status epilepticus (FSE) group than in controls, with hippocampal malrotation being the most common.[17] This study has demonstrated that children with FSE are at risk for acute hippocampal injury and that a substantial number also have abnormalities in hippocampal development.

Electroencephalography (EEG): The AAP recommends that an EEG should not be performed in the evaluation of neurologically healthy children with a simple febrile seizure,[1,19] but EEG may be useful for evaluating patients with complex or atypical features or with other risk factors for the development of epilepsy.[20] An EEG would not predict the future recurrence of febrile seizures or epilepsy even if the result is abnormal.[1] Spikes during drowsiness are often seen in children with febrile seizures, particularly those older than age 4 year, and these do not predict later epilepsy. EEGs performed within 2 weeks of a febrile seizure often have nonspecific slowing, usually posteriorly. Thus, in many cases, if an EEG is indicated, it is delayed until or repeated after more than 2 weeks have passed.[1]

Treatment

Treatment of ongoing seizures

Acute[1,]:



Rectal diazepam (0.2-0.5mg/kg) is often prescribed to be given at the time of reoccurrence of a febrile seizure lasting longer than 5 min. Alternatively, buccal or intranasal midazolam(0.15mg/kg) may be used and is often preferred by parents.[1] Prolonged seizures are accompanied by an increased risk of complications, and treatment should be initiated before it reaches >5 minutes in duration. Prolonged FS should be treated acutely using the same algorithm as prolonged seizures caused by other aetiologies. A prolonged FS if continued then a full SE protocol should be initiated.[23] FSE is a neurological emergency and the most common cause of SE in children younger than two years of age.[22] Most children should be observed until they are awake and alert. Children, especially those with a first febrile seizure, should be hospitalized if any of the following are present: (*i*) Lethargy beyond postictal state; (*ii*) Unstable clinical status; (*iii*) Age <18 months; (*iv*) Complex features; (*v*) Uncertain home situation; (*vi*) Unclear follow up. Any child with the slightest suspicion of meningitis should be admitted and investigated[4].

Chronic: Using round-the-clock prophylactic administration of antipyretics has not been shown to affect the incidence of recurrence of FS and is not recommended. It is not recommended to treat children with FS using daily anti-epileptic medications because of high likelihood of adverse effects.[23]

Recurrence: The risk of recurrence is influenced by both the age of the child and the type of FS. About one-third of children with a first FS will have a recurrence. If there is no risk factors a recurrence risk of approximately 12%; 1 risk factor, 25-50% **(mild risk)**; 2 risk factors, 50-59% **(intermediate risk)**; 3 or more risk factors, 73-100% **(high risk) (box-1)**.

Long Term Management

The primary goal of long-term management of febrile seizure is to prevent recurrences. Treatment options include:

(*a*) Prolonged daily prophylaxis with phenobarbitone(3-5mg/kg) or valproate (15-60mg/kg)

(*b*) Intermittent prophylaxis with diazepam or other benzo-diazepines like clobazam (0.3-1mg/kg maximum 10 mg).

Continuous Prophylaxis

Phenobarbital is effective in preventing the recurrence of simple febrile seizures.[24,25] Long-term phenobarbital treatment appears to influence cognition and behaviour, a large price for prevention of benign condition.[4] Valproate is as effective as phenobarbitone in preventing recurrent, simple febrile seizures. In randomized controlled studies, only 4% of children taking valproate as opposed to 35% of control subjects had a subsequent febrile seizure.[26] Drawbacks to therapy with valproate include its rare association with fatal hepatotoxicity, thrombocytopenia, weight loss and gain, gastrointestinal disturbances and pancreatitis. Continuous prophylaxis may be considered for children with a high risk for later epilepsy.

Intermittent Benzodiazepine Prophylaxis

Diazepam administered intermittently either rectally as suppositories, or solution or orally at the onset of fever has been shown to be effective in preventing recurrence of febrile seizures.[4] By either route, generally a dose of 0.3 to 0.5 mg/kg (max 10 mg) is used. A maximum of 4-5 doses are given per illness.[27] Intermittent clobazam (0.3-1mg/kg/day) given orally for 2 days has also been found to be useful in preventing febrile seizure recur-rences.[28] Adverse effects of oral diazepam include lethargy, drowsiness and ataxia. The sedation associated with this therapy could mask evolving signs of meningitis. Some children show signs of irritability and restlessness due to clobazam. According to a study, risks of recurrent febrile seizure in the Diazepam group was 2.6 times greater compared to those in the clobazam group. The result indicates that Clobazam is safe, efficacious, requires less frequent dosing and has less adverse effects such as drowsiness, sedation, ataxia and irritability as compared to Diazepam.[29] It must however be remembered that this therapy does not decrease the incidence of later epilepsy in children with febrile seizures.[30]

Patient Education

It is the most important aspect of management of febrile seizures.[1,4] As seizures in their child can be very frightening for the parents they should be counselled properly with particular emphasis on:

(i) The benign nature of the febrile seizures.

(ii) That febrile seizures do not lead to neurological problems or develop-mental delay.

(iii) What they should do immediately if their child has another seizure.

(iv) A doctor should be consulted if the seizure lasts for more than 5 min.

Difference from epilepsy

Epilepsy is a disease of the brain defined by any of the following conditions.[31]

1. At least two unprovoked (or reflex) seizures occurring >24 h apart
2. One unprovoked (or reflex) seizure and a probability of further seizures similar to the general recurrence risk (at least 60%) after two unprovoked seizures, occurring over the next 10 years

3. Diagnosis of an epilepsy syndrome

Epilepsy is considered to be resolved for individuals who had an age-dependent epilepsy syndrome but are now past the applicable age or those who have remained seizure-free for the last 10 years, with no seizure medicines for the last 5 years.

Febrile seizure is primarily a provoked seizure. But in the long run it can progress to epilepsy. There is difference in incidence of epilepsy in different type of febrile seizures (table-1).

Conclusion

Febrile Seizures are generally benign events and do not cause lasting intellectual or neurologic damage. EEG and neuroimaging are not indicated in the usual evaluation of simple febrile seizure. Acute treatments are indicated when seizure is prolonged. Anti-epileptic therapy either intermittent or continuous can prevent recurrences of febrile seizure but does not prevent subsequent epilepsy. Most children with febrile seizures do not require anti-epileptic therapy; in cases of severe parental anxiety and/or multiple recurrences, intermittent therapy may be advised. Early diagnosis and better management of the febrile seizure at the primary health care setting will prevent unnecessary admission and referral. Primary physicians should emphasize on parent counselling & education because this plays pivotal role in management of the febrile seizure.

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Public Health Legislations in India (Part-I)

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Introduction

Right to health is one of the fundamental human rights which is often compromised by outcomes of human behaviour either individually or as a social group, which are faced by the entire population in everyday life. This can be managed by changing the health behaviour through one of the basic approaches like- regulatory approach, service approach and health education approach. Though health education is the ideal approach but many times regulatory approach is also necessary considering the seriousness of the issue. The holistic vision of Indian medicine focusing on philosophy, technical and scientific aspects, has grabbed attention of many historians over the years and has evolved traversing a long path with constant changes adopted through trial and error method. Not only the form of medical care, but also the code of conduct has gained focus lately. Continuous efforts were done to make this science a legal, ethical and morally focused one. To strengthen the health care system, a focused legislatory approach is a pre-requisite.

Universal health care forms the platform over which the health care system of India takes its strength. It is a concerted effort made by the central governments and states/Union territories. The constitution charges every state for the improvement of public health among its primary duties. Laws are an obligation on the part of society imposed by the competent authority which have been instrumental in controlling such public health issues and hence referred to as public health legislations.

Public health legislation concerns the legal power and duties of the state to improve the health of the general population (e.g. to identify, prevent and ameliorate risks to health in the population) and the limitations on the power of the state to constrain the autonomy, privacy, liberty, proprietary or other legally protected interests of individuals for the protection or promotion of community health. [1] The scope of public health law is not limited; it is as broad as public health itself and both have expanded a lot to meet the needs of the society.[2]

The **objectives** of public health legislations are to

- Protect and promote the health of their population,
- Sustain the health policies and programs,
- Prevent ill health resulting from unsafe products and unsafe living conditions,
- Fight new and re-emerging communicable disease,
- Support the development of health systems,
- Combat continuing poverty, inequities in health and discrimination.[3]

The Constitution of India has sufficient provision for the protection, promotion and growth of every individual, worker, groups and vulnerable population in relation to health and nutrition. To achieve these goals, various acts are adopted.

Important Indian legislations in this direction can be grouped into following categories for better understanding.

In CME-I, legislations related to qualifications, substance abuse, public health problems, women, child, older and disable persons is covered while, in CME-II legislations related to commissioning of the hospital, census, occupational health, environment, medico-legal and financial aspects will be covered.

Laws Governing to the Qualification/Practice and Conduct of Professionals

These are the legislations dealing with i) recognition of qualifications ii) for performing technical jobs assigned iii) for maintenance of codes of "conduct and ethics" for hospital staff employed in delivery of the health care. Both the Indian Medical council act and The Dentist act were amended in 2016 to conduct a uniform entrance examination to all medical educational institutions at the undergraduate level and post-graduate level. A medical practitioner may carry out, participate in or

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work in research projects funded by pharmaceutical and allied health care industries, but has to ensure that the particular project has due permission from the competent authorities and the research project gets clearance from an institutional ethics body as per the amendment of Indian Medical Council (Professional Conduct, Etiquette and Ethics) (Amendment) Regulations, 2009 - Part-I". The NMC Bill, 2017, which seeks to replace the existing apex medical education regulator, the Medical Council of India (MCI), with a new body, was moved by the government in Parliament on December 29, 2017. Recently a parliamentary panel has said the 'bridge course', proposed in the National Medical Commission (NMC) Bill, to allow practitioners of alternative medicines such as homoeopathy and Ayurveda to practice allopathy, should not be made a mandatory provision and the decision should be left to states.

Table-1: Laws Governing to the Qualification/Practice and Conduct of Professionals

S. No	Name of Act/Rule	Aim
1.	The Indian Medical council Act, 1956	Reconstitution of MCI & maintenance of medical register and for matters connected therewith.
2.	Indian medical council (professional conduct, etiquette and ethics) regulations, 2002	Regulations of professional conduct, etiquette and ethics for Registered medical practitioners.
3	The Indian Medical Degree Act, 1916	Regulate the grant of titles implying qualification in western medical Science.
4.	The Indian Medicine Central Council Act,1970	Regulate Indian System of Medicine viz Ayurved, Siddha, Unani Tibb; maintain the central register and ethics.
5.	The Dentist Act,1948	Regulate standard of dental education, profession and ethics.
6.	Indian Nursing Council Act,1947	Regulate uniform standard of training for nurses, midwives and health visitors.
7.	The Delhi Nursing Council Act, 1953	Registration and inspection of nursing home(s) in the state of Delhi.
8.	The All India Council for Technical Education Act,1987	Establishment of an All India Council for Technical Education, planning, coordination and maintenance of norms and standards.
9.	The Apprenticeship Act, 1961	Regulation and control of training of apprentices.
10.	The Rehabilitation Council of India Act, 1992	Regulate the training of rehabilitation professionals and the maintenance of a Central Rehabilitation Register.
11.	The Paramedical and Physiotherapy Central Councils Bill, 2007	Constitution of Central Councils of the Paramedical (Medical Laboratory Technology), Paramedical (Radiology Technology) and Physiotherapy, regulating and maintaining standards of such education, maintenance of Register of Paramedics and Physiotherapists.
12.	The Pharmacy Act,1948	Regulate the profession and practice of pharmacy.
13.	The Homeopathy Central Council Act,1973	Constitution of a Central Council of Homeopathy and maintenance of a Central Register of Homeopathy.
14.	The Indian medicine and Homeopathy pharmacy bill, 2005	Regulation of the profession and practice of pharmacy in Indian medicine and Homoeopathy and to constitute Pharmacy Councils and for matters connected therewith.
15.	The Kerala Anatomy Act	Provide for the supply of [*********] bodies of deceased persons to teaching medical institutions for anatomical examination and dissection.
16.	Allied and Healthcare Professional's Central Council Act, 2015.	Regulation and maintenance of the standards of education and practice of Allied and Healthcare Professionals.

Laws governing to prevent drug addiction and substance abuse, tobacco control and safe manufacturing of drugs, distribution and storage.

These are laws to regulate manufacture, distribution supply and sale of drugs, chemicals, tobacco, blood and blood products and prevent misuse of all these.

Table-2: Legislation for drug addiction &/or substance abuse

S. No	Name of Act/Rule	Aim
1.	The Drugs and Cosmetics Act, 1940	Regulate the import, manufacture, distribution and sale of drugs.
2.	The Drugs (Control) Act, 1950	Control of the sale, supply and distribution of drugs.
3	The Narcotic Drugs and Psychotropic Substances Act, 1985	Amend law relating to narcotic drugs; make provisions for the control and regulation of operations relating to narcotic drugs and psychotropic substances.
4.	The Central excise Act (for permit to use and store spirit),1944	Consolidate and amend the law relating to Central Duties of Excise.
5.	The Value Added Tax Act, 1991	Imposition of value added tax on goods and services.
6.	The Central Sales Tax Act,1956	Determine sale or purchase, import or export of goods takes place in the course of inter-State trade or commerce or outside a State; provide for the levy, collection and distributions of taxes.
7.	The Sales of Good Act,1930	Define and amend the law relating to the sale of goods.
8.	The Drugs & Magic Remedies Act, 1954	Control the advertisement of drugs in certain cases; prohibit the advertisement of remedies alleged to possess magic qualities.
9.	Indian Penal Code Sec 274	Punishment for Adulteration of drugs **.**
10.	Indian Penal Code Sec 275	Sales of adulterated drugs**.**
11.	Indian Penal Code Sec 276	Sales of drug as different drug or Preparation.
12.	Indian Penal Code Sec 284	Negligent conduct with regard to poisonous substances.
13.	The Cigarettes and Other Tobacco Products Act 2003	Prohibit the advertisement; regulation of trade and commerce; production, supply and distribution of cigarettes and other tobacco products.

Laws governing to Prevent Epidemics and disaster Management, and Public Health Problems

The Act provides power to exercise for the control and to prevent any epidemic, spread of epidemic, any disasters or public health problems in the states or country and to take such measures if the state feel that the public at large is threatened with an outbreak of any dangerous epidemic or disasters.

Table-3: Laws governing to Prevent Epidemics and disaster Management, and Public Health Problems

S. No	Name of Act/Rule	Aim to
1.	The Vaccination Act, 1880	Prohibit inoculation and to make the vaccination of children compulsory in certain Municipalities and Cantonments.
2.	The Epidemic Diseases Act, 1897	Better prevention of the spread of dangerous epidemic diseases.
3	Public Liability Insurance Act, 1991	Public liability- insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling any hazardous substance.
4.	The Transplantation of Human Organ Act, 1994	Regulation of removal, storage and transplantation of human organs and tissues for therapeutic purposes and for the prevention of commercial dealings in human organs and tissues.

5.	The Air Craft Act, 1934	Control of the manufacture, possession, use, operation, sale, import and export of aircraft.
6.	The Delhi Antismoking & Non-smoking Health Protection Act, 1996	Prohibiting of smoking in places of public work or use and in public service vehicles in the National Capital Territory of Delhi.
7.	Essential Commodity Act, 1955	Control of the production, supply and distribution of, and trade and commerce.
8.	The Protection of Human Rights Act, 1993	Constitution of a National Human Rights Commission, State Human Rights Commissions in States and Human Rights Courts for better protection of human rights.
9.	The Prevention of Food adulteration Act, 1954	Prevention of adulteration of food.
10.	Food Safety and Standards Act, 2006	Laws relating to food and to establish the Food Safety and Standards Authority of India for laying down science based standards for articles of food and to regulate their manufacture, storage, distribution, sale and import, to ensure availability of safe and wholesome food for human consumption.
11.	The National Food Security Act, 2013	Food and nutritional security in human life cycle approach, by ensuring access to adequate quantity of quality food at affordable prices to people to live a life with dignity.

Laws Governing Women Empowerment and Health

Laws pertaining to women in India are broadly defined as constitutional (depicted under various provision of constitution) and legal (under various laws of parliament and state legislations). The rights enshrined in the constitution and various legislations are enlisted below.

Table-4: Laws Governing Women Empowerment and Health

S. No	Name of Act/Rule	Aim to
1.	The Hindu Marriage Act, 1955	Codify the law relating to marriage among Hindus.
2.	The Special Marriage Act, 1954.	Special form of marriage in certain cases, for the registration of such and certain other marriages and for divorce.
3	The Child Marriage Restraint Act, 1979	Restrain the solemnization of child marriages.
4.	The Hindu Succession Act, 1959	Amend and codify the law relating to intestate succession among Hindus
5.	The Indian Succession Act, 1925.	Law applicable to intestate and testamentary succession.
6.	The Dowry Prohibition Act, 1961	Prohibit the giving or taking of dowry.
7.	The Commission of Sati (Prevention) Act, 1987	More effective prevention of the commission of sati and its glorification and for matters connected therewith.
8.	Indian Penal Code Sec 498	Cruelty to a woman within the matrimonial home.
9.	The Family Court Act, 1984	establishment of Family Courts with a view to promote conciliation in, and secure speedy settlement of, disputes relating to marriage and family affairs.
10.	The Protection of Women From Domestic Violence Act, 2005	More effective protection of the rights of women guaranteed under the Constitution who are victims of violence of any kind occurring within the family.
11.	The Maternity Benefit Act, 1961	Regulate the employment of women in certain establishments for certain periods before and after child-birth and to provide for maternity benefit.
12.	The Criminal Law, 1983	Amend the Indian Penal Code, the Code of Criminal Procedure, 1973 and the Indian Evidence Act, 1872.

13.	The Immoral Traffic (Prevention) Act ,1956	Pursuance of the International Convention signed at New York on the 9th day of May, 1950, for the prevention of immoral traffic.
14.	The Medical Termination of Pregnancy (MTP) Act, 1971 and the MTP Rules and Regulations, 2003	Termination of certain pregnancies by registered medical practitioners.
15.	Indian Penal Code Sec 375,376, 228-A, 509 & 511	Punishment for rape, insulting the modesty of a woman.
16.	Sec 114A of Indian Evidence Act, 1872	Presumption as to absence of consent in certain prosecutions for rape.
17.	The indecent representation of women (Prohibition Act),1986	Prohibit indecent representation of women through advertisements or in publications, writings, paintings, figures or in any other manner.
18.	Indian Penal Code Sec 372,373, 360, 371	Punishment for selling minor for prostitution, kidnapping.

Laws governing Child Protection and Health

Children being the future workforce of the nation, it is the responsibility of the state to ensure child safety and safeguard their rights. Mentioned below are the rights and laws pertaining to child health in India.

Table-5: Laws governing Child Protection and Health

S. No	Name of Act/Rule	Aim to
1.	The Pre-Conception and Pre-Natal Diagnostic Techniques 886 (Prohibition of Sex Selection) Act, 1994	Prohibits determination and disclosure of the sex of foetus; prohibits any advertisements relating to pre-natal determination of sex and prescribes punishment for its contravention.
2.	The Infant Milk Substitutes, Feeding Bottles and Infant Food (Regulation1of Production, supply and Distribution) Act, 1992	Regulation of production, supply and distribution of infant milk substitutes, feeding bottles and infant foods with a view to the protection and promotion of breastfeeding and ensuring the proper use of infant foods.
3	The Juvenile Justice (Care and Protection of Children) Act, 2000	Juveniles in conflict with law and children in need of care and protection; providing for proper care, protection and treatment by catering to their development needs; adopting a child-friendly approach in the adjudication and disposition of matters in the best interest of children and for their ultimate rehabilitation.
4.	The Child Labor (Prohibition and Regulation) Act, 1986	Prohibit the engagement of children in all occupations and to prohibit the engagement of adolescents in hazardous occupations and processes.
5.	The Prohibition of Child Marriage Act, 2006	Prohibition of solemnization of child marriages.
6.	Protection of Children from Sexual Offences Act, 2012	Deals with sexual offences against persons below 18 years of age, who are deemed as children.
7.	The Right to Education Act, 2008	Free and compulsory education to all children of the age of six to fourteen years.
8.	Guardians and Wards Act, 1890	Consolidate and amend the law relating to Guardian and Wards.

Legislation Governing Old Persons & Welfare Rehabilitation of Disadvantaged

These laws ensure maintenance of provision for food, clothing, residence and medical attendance and treatment to lead a better quality of life of elderly and persons with disabilities.

Table-6: Legislation Governing Old Persons & Welfare Rehabilitation of Disadvantaged

S. No	Name of Act/Rule	Aim to
1.	Maintenance and Welfare of Parents and Senior Citizens Act, 2007	Maintenance and welfare of parents and senior citizens.
2.	The Persons with Disabilities (Equal Opportunity, Protection of Rights and Full Participation) Act, 1995	Proclamation on the full participation and equality of the people with disabilities in the Asian and Pacific Region.
3	The National Trust for Welfare of Persons with Autism, Cerebral palsy, Mental retardation and Multiple Disabilities Act, 1999 and Rules, 2000	Constitution of a body at the National level for the welfare of persons with autism, cerebral palsy, mental retardation and multiple disabilities and for matters connected therewith.
4.	Mental Health Act, 1987	Treatment and care of mentally ill persons, to make better provision with respect to their property and affairs.
5.	National Rural Employment Guarantee Act, 2005	Enhancement of livelihood security of the households in rural areas of the country by providing at least one hundred days of guaranteed wage employment in every financial year to every household whose adult members volunteer to do unskilled manual work.
6.	The Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Act, 1989	Prevent the commission of offences of atrocities against the members of the Scheduled Castes and the Scheduled Tribes; provide for the trial of such offences; relief and rehabilitation of the victims of such offences.
7.	The Employment of Manual Scavengers and Construction of Dry Latrine (Prohibition) Act, 1993	Prohibition of employment of manual scavengers as well as construction or continuance of dry latrines and for the regulation of construction and maintenance of water-seal latrines.
8.	Indian Lunacy Act, 1912	Consolidate and amend the law relating to Lunacy.
9.	Lepers Act, 1898	Segregation and medical treatment of pauper lepers and the control of lepers following certain callings.
10.	Ear Drums and Ear Bones (Authority for Use for Therapeutic Purposes) Act, 1982	Use of ears of deceased persons for therapeutic purposes.
11.	Eyes (Authority for Use for Therapeutic Purposes) Act, 1982	Use of eyes of deceased persons for therapeutic purposes.

Conclusion

Every public health legislation is ultimately aimed at improving the public health standard in the country. But its utility depends on its proper implementation. It is also necessary to emphasize here the fact that no public health legislation can remain stagnant. Public health legislation has to evolve with the changing health scenario. In a country like India, where the health indicators are yet to reach the desired targets, effective implementation of public health legislations may improve the picture to a certain extent.

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ORIGINAL ARTICLE

How Far we are from Achieving Universal Health Coverage? A Situational Analysis and Way Forward for India

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Abstract

Introduction: Universal Health coverage (UHC) is required for fulfilment of Health for All. Currently World Health Organization has proposed indicators for tracing coverage of UHC. This study aimed to find the current status of the UHC in India and Indian States. **Material and Methods:** Data were collected from the national data portals, national surveys and annual reports of ministry. In case of non-availability, numerator and denominator were used from different sources. Data were entered in to Microsoft excel and analysed using Stata-12. **Results:** Coverage indicators for Non Communicable diseases and cataract surgery were not available in any national survey or national report of ministry. Coverage of none of the health system indicators were found to be 100%. Few indicators like Skilled attendance at birth, TB cure rate, Preventive chemotherapy against filariasis, access to improved water source had a coverage of 80%. Across the states and union territories the coverage was variable but no significant difference was observed between the EAG and Non EAG states. Very few states have achieved the minimum coverage of 80% in various coverage indicators. **Conclusion:** There is non-availability of some data and some data were collected in duplication. Because of the lack of data, it is not yet possible to compare the UHC service coverage index across key dimensions of inequality. Until these data gaps are overcome, inequalities in service coverage cannot be assessed.

Keywords: Universal Health coverage, DLHS-4, NFHS-4

Introduction

Universal Health Coverage (UHC) which emerged in the World Health Assembly 2005 is defined as "The access to key promotive, preventive, curative and rehabilitative health interventions for all at an affordable cost, thereby achieving equity in access".[1] UHC is an important prerequisite not only for attaining health related Sustainable Development Goals (SDG) but also for poverty reduction and economic growth. [2,3] UHC has three main dimensions - universal population coverage by quality health care, providing universal range of comprehensive health services and universal financial protection towards health expenditure.[4] Each domain is stand alone and has equal impact on the universalization of health. India in 2010 constituted a High level Expert Group (HLEG) on Universal Health Coverage to formulate a framework for accessible & equitable, affordable & assured quality, comprehensive & appropriate healthcare system entitling every citizen to essential primary, secondary and tertiary health care services guaranteed by the government.[5] This HLEG planned to achieve UHC through increase in public health expenditure, reorientation of health care to primary health care system, health insurance and trained health care personals.

Recently, World Health Organization (WHO) has recommended types of indicators for tracking UHC – one related to health services and other to cost, with equity being the underlying components in both. [6] Health services indicators include both treatment and prevention. Although around 100 core indicators are available from this only thirteen indicators were selected. These indicators were related to maternal and child health, sanitation and hygiene, family planning, coverage of Non communicable disease, tuberculosis, Human Immunodeficiency Virus

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(HIV) treatment, cataract treatment and preventive chemotherapy against any Neglected Tropical Diseases. WHO proposed at least 80% coverage for health service related components irrespective of the social and economic status.[6]

This study aims to review the current situation of Indian states and the country as a whole for Universal Health Coverage in light of the prescribed WHO health system tracer indicators.

Material and Methods

This was a cross-sectional secondary data analysis conducted in year 2017. We searched for nationally representative data conducted on or before 2016. More specifically data related to the thirteen WHO UHC coverage indicators were the focus of the search. For this recent national surveys done in India were reviewed from government web portals.[7-14] For each indicator a different source was searched if not available from a single survey. Those surveys which were not nationally representative or conducted after 2016 were excluded from the survey. We also reviewed the national report of the concerned ministry in case the indicators were not covered in the national surveys. If the indicators were not available from a single source, the numerator and denominators from different surveys or national reports (difference between the surveys being no less than five years apart) were used for calculation of the Indicator. In case of non-availability of state wise records, the survey data dissemination authority was contacted for providing data. If multiple national sources were available national surveys were given preference than the annual reports. If multiple national surveys were conducted, then the recent ones were selected. No state level indicators were included in this study.

Detailed description of Indicators

Maternal and child health indicators: There were four maternal and child health indicators in the list. All were commonly reported in various national and state level surveys. Family planning coverage which indicates the proportion of sexually active women protected by any modern contraceptive method. Antenatal care coverage indicates the proportion of live births in which mother had 4 or more ANC visits. Skilled attendance defined as the proportion of live births attended by the skilled health personnel. Immunization is only one of the child health component included in the indicator list, which includes the proportion of children younger than one year immunized with 3 doses of vaccine.

Indicators related to safe water and sanitation: proportion of population with improved source of water like piped water/ public tap/ tube well/ rain water collection. Proportion of population having access to latrine with piped sewer system.

Indicators related to protection against any one of the neglected tropical diseases from those population requiring the same. Similarly, treatment coverage indicators include two of the important diseases HIV and Tuberculosis. The numerator includes the people receiving ARV therapy among those diagnosed with HIV. Tuberculosis coverage indicators used the proportion of the cured new diagnosed tuberculosis population. Non-Communicable Disease (NCD) treatment coverage included the proportion of population diagnosed with NCDs aged more than 18 years receiving medication for hypertension and diabetes. Cataract surgical coverage includes persons aged ≥ 50 years who have operable cataract either in one eye or both and operated for cataract either in one or both eye.

Analysis

Data were entered in to Microsoft excel and were analysed using Stata 12. Data were represented in distribution dot plot and bar diagram. Matrix plot was used to show the coverage in different quintiles. Data were segregated according to type of state i.e. Empowered Action Group (EAG) or Non Empowered Action Group (NEAG).

Results

Availability of Data

All maternal and child health component indicators and indicators of sanitation & water were available in national surveys like National Family and Health Survey-4 (NFHS-4), District Level Family and Health Facility Survey-4 (DLHS-4) and Annual Health Survey 2011-12 (AHS).[7,8,10] In DLHS-4 all states were not covered neither the compiled all India data was available. For the same reason Annual health survey was also not taken in to account. Data on tobacco use was also available in NFHS-4, DLHS-4 and AHS. Tobacco use data separately for male and female were available in NFHS and DLHS reports. But combined data was not available in the NFHS/ DLHS survey, thus GATS (Global Adult Tobacco Survey) conducted in 2009 was taken in to account.[13] In Anti-Retroviral Therapy coverage the numerator was taken from annual report of NACP 2014-15 and denominator was taken from the HIV estimates (2015) of National AIDS Control Program (NACP).[14,15] Similarly, tuberculosis treatment coverage was collected from annual report (2016) of Revised National Tuberculosis Control Program (RNTCP).[11] Non communicable disease related data was not available in any of the national reports. Similarly, cataract surgical coverage data (neither numerator nor denominator) was not available from neither the national surveys nor the program national reports.

India as a whole

Available data suggests that none of the service components has 100% population coverage, including basic factors like water and sanitation. Family planning coverage, PLHA receiving ART therapy, and Improved Sanitation has not covered half of the population in India while ANC with 4 or more ANC visits has just covered half of population. Whereas 90% population had access to safe

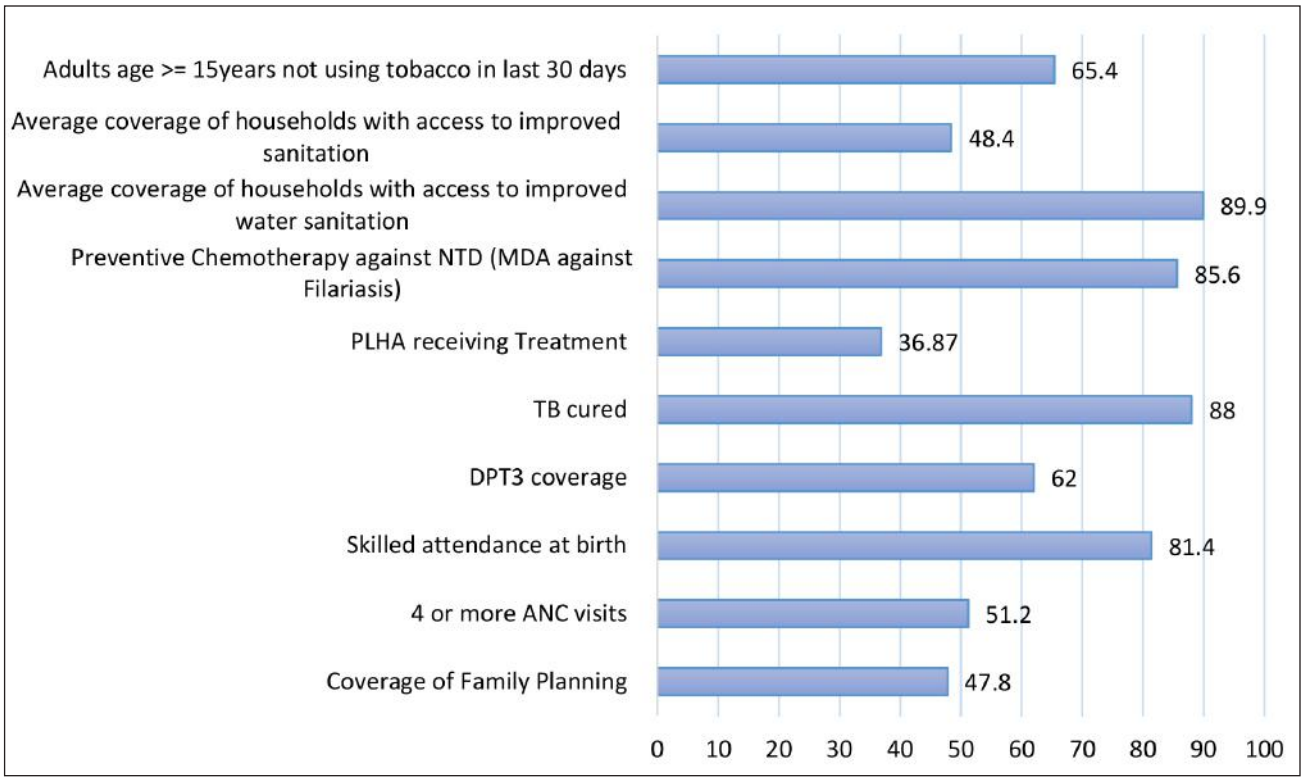

Figure-1: Progress of various indicators for UHC in India

water. Preventive Chemotherapy against Filariasis (Mass Drug Administration) although not done throughout India, but in the affected areas it had a coverage of around 86%. Around 35% of the population aged more than 14 years were found to be consuming tobacco in last 30 days. (Fig-1)

Distribution of Indicators across the states and union territories

Family planning coverage, ANC visit coverage, PLHA receiving treatment and access to improved sanitation showed a wide variation across different states. Whereas the TB cured, MDA against filariasis had very narrow distribution. For coverage of family planning, and TB cured in all states lied below the minimum acceptable coverage of 80%. Whereas the treatment coverage in PLHA in most of the states lied below the acceptable range of 80% except two states Himachal and Chandigarh. (Fig-2)

When segregated in to categories of EAG (Empowered Action Group) and Non EAG states, we found that majority of the coverage indicators for EAG states were below the level of 80% except skilled attendance at birth, access to improved water source, MDA against Filariasis. Coverage indicators for EAG states for family planning were below 80% in all states where as treatment coverage indicator for PLHA remained below 80% in most of the states except two states. Figure 4 showed the coloured matrix of quintile distribution of various indicators across the different states.

Maternal and Child Health Services including family planning

Overall at the national level modern methods of family planning coverage was around 48% in NFHS-4 survey which is nearly same as NFHS-3 report (48.5%). So we can say that there is nearly no improvement of up taking of family planning methods in last decade. Among all states Manipur (12.7%) has the lowest coverage of family planning services followed by Lakshadweep (14.9%). The reason can be attributed to the fact that most of the young women in Manipur are still practicing natural method of contraception (rhythm/calendar method) as family planning method[16] and also rate of sterilization is

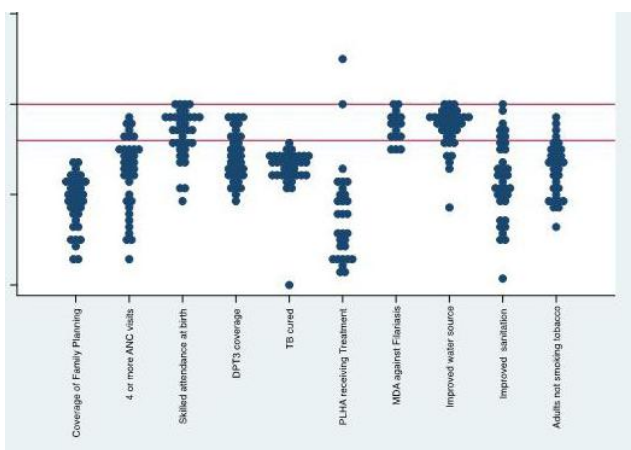

Figure-2: Distribution of various indicators among different states

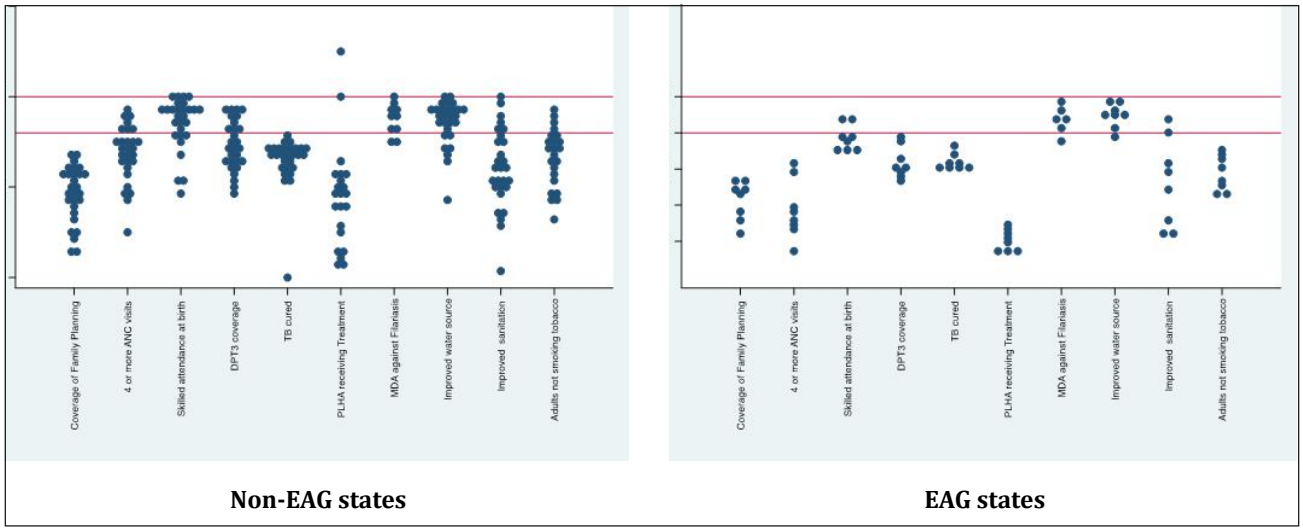

Figure-3: Distribution of various indicators according to type of state

decreased due to non-availability of facility. Many of the low performing EAG states has low coverage including Bihar, Uttar Pradesh, where as in Non EAG states the coverage ranged from 69% in Andhra Pradesh to as low as 13% in Manipur.

Pregnant women with four or more ANC check-ups ranges from 14% in Bihar to 59% in Chhattisgarh in EAG states where as in Non EAG states it ranges from 26% in Nagaland to 81% in Tamil Nadu. The reason for four ANC visit in Bihar can be due to poor doctor-patient ratio especially at PHCs and CHCs and also poor coverage of health facility at hard to reach area[17]. Many states lie above the national average of 51.2% with North Eastern States mainly laying below the national average.

Skilled attendance at birth which included trained personnel including the trained dais, national average lies at 81.4%. Among EAG states except Odisha, Rajasthan all other states had skilled attendance at birth below the national coverage. Among Non EAG states all north Eastern States lies below the national average whereas all other states lies above the national average.

From immunization services, DPT3 coverage at national level was around 62%. In EAG states it varies from as low as 47% in Assam to 78% in Odisha. In non EAG states it varies from as low as 50% in Gujrat to as high as 93% in Kerala.

Tuberculosis & HIV treatment coverage (Fig-3)

In India the tuberculosis cure rate was 88% according to national report. In EAG states Chhattisgarh (91%) and in Non-EAG states Nagaland (90%) had their cure rate above the national average and they have also achieved the target for End TB strategy 2016-2035 for TB cure rate. Rest all the states had their cure rate below the national average with Bihar having the lowest rate of 76%. In Bihar premature TB treatment discontinuation and symptom persistence is particularly high among individuals who have failed to complete treatment for a prior episode. Another reason could be rise in XDR TB in the Bihar state and hence there cure rate decrease.[18]

Similarly, for PLHIV receiving ART was at a very low level around 37%. Among all states Himachal Pradesh has achieved the 100% coverage of ART. In EAG states Uttarakhand has the highest coverage while Odisha has the lowest coverage. While in Non EAG states Tripura has the lowest coverage of 15% which is lowest among all Indian states. The reason could be doubled the rate of new infection of HIV in the state during 2010-2016 (consistent condom use was only 36% among FSW, in comparison to national coverage of 55%) and also only 15% of PLHIV were aware of their status.[19]

Access to Improved supply of water and Hygiene (Fig-4)

Around 90% population in India had access to improved water while improved sanitation was available to only 48% population. When analysed state wise among EAG states Chhattisgarh (98.2%) and among non EAG states & overall Meghalaya (99.1%) had highest proportion of population having access to improved water supply. But when it comes to sanitation in Jharkhand had the lowest sanitation coverage while Uttar Pradesh has highest coverage among EAG states. Similarly, among non EAG states Arunachal Pradesh (97.7%) had highest while Manipur (29.4%) had the lowest coverage of improved sanitation.

Preventive chemotherapy against Filariasis

Currently preventive chemotherapy against Filariasis is done in coastal areas and few other affected states. In India the overall coverage rate was around 87% while highest was in Odisha with coverage around 98% while lowest was in West Bengal with coverage of 83% among the covered states.

	Coverage of Family Planning	4 or more ANC visits	Skilled attendance at birth	DPT3 coverage	TB cured	PLHA receiving Treatment	MDA against Filariasis	Improved water source	Improved sanitation	Adults not smoking tobacco
Andaman & Nicober	50.8	92.1	92.3	73.2	56.0			94.3	74.3	
Andhra pradesh	69.4	76.3	92.2	65.3	75.0	45.5	92.3	72.7	53.6	70.8
Arunachal pradesh	43.9	43.8	52.6	71.1	61.0	8.1	73.3	92.3	97.7	52.3
Assam	37	46.5	74.3	47.1	53.0	25.5	90.7	91.7	63.1	60.7
Bihar	23.3	14.4	70	61.7	60.0	14.5	86.3	83.8	47.7	46.5
Chandigarh	58.2	64.5	93.3	79.5	78.0	125		99.5	82.9	85.7
Chattisgarh	54.5	59.1	78	76.4	61.0	20.6	87.6	98.2	25.2	46.8
Dadra & Nagar Haveli	37.9	75.6	89.5	73.3	74.0			77.5	35.4	
Daman& Diu	31.6	62.7	77	66.3	68.0			89.4	60.4	
Delhi	47.3	68.6	86.9	83.7	71.0			85.7	74.0	75.7
Goa	24.8	89	97.5	94.2	67.0	46		96.3	78.3	91.2
Gujarat	43.1	70.6	87.3	50.4	72.0	27.1	98.4	84.7	33.7	70.6
Haryana	59.4	45.1	84.7	62.2	69.0	12.6		91.5	51.9	76.3
Himachal pradesh	57.7	58.3	93.4	76.2	73.0	100.3		41.6	49.9	78.8
J&K	46.1	81.4	87.6	88.1	69.0	53.2		89.2	52.5	73.4
Jharkhand	37.5	30.3	69.6	61.9	67.0	15.1	75.2	77.8	24.4	49.9
Karnataka	51.3	70.3	93.9	62.6	58.0	56.6	76.7	67.9	60.3	71.8
Kerala	55.7	86	99.7	92.7	67.0	39.7	82.3	83.7	86.4	78.6
Lakshadweep	14.9	82.8	100	94.2	0.0			91.5	99.4	
Madhya pradesh	49.6	35.7	78.1	53.6	62.0	27.6	91.5	91.1	32.7	60.5
Maharashtra	62.6	72.2	91.1	56.3	54.0	48.8	93.6	70	83.4	68.6
Manipur	12.7	69	77.2	65.9	64.0	39.8		88.8	29.4	45.9
Meghalaya	21.9	50	53.8	61.5	59.0	50.9		99.1	66.3	44.8
Mizoram	59	61.6	79.6	82.5	73.0	57.2		85.5	45	32.8
Nagaland	23.9	26.5	47.6	66	73.0	45.3		97.6	88.2	43.2
Odisha	45.4	62	86.6	78.6	60.0	14.1	98.4	90.9	64.3	53.8
Puducherry	61.2	87.7	100	91.3	71.0	65		65	4.7	65.38
Punjab	66.3	68.5	94.1	89.1	69.0	39.1		90.6	55.2	88.3
Rajasthan	53.5	38.5	86.6	54.8	72.0	21.2		91.7	79.2	67.7
Sikkim	45.9	74.7	97.3	83	70.0	11.1		77.6	50.2	58.4
Tamilnadu	52.6	81.2	99.3	69.7	60.0	58.1	97.3	87.3	61.3	83.8
Telangana	56.9	75	91.4	68.1	68.0		90	96.4	35	
Tripura	42.8	64.3	69.1	54.5	70.0	7.5		92.9	64.5	44.1
Uttar pradesh	31.7	26.4	75.8	66.5	61.0	24.1	83.4	96.5	87	66.1
Uttarakhand	49.3	30.9	71.2	57.7	63.0	30.2		89.3	57.8	69.3
West bengal	57	76.5	81.7	84.4	65.0	15.7	83.2	94.6	50.9	63.7
		0-20	21-40	41- 60	61- 80	81-100	NA			

NA - Not available

Figure-4: Matrix plot showing distribution of Indicators according to type of state

Not Consuming Tobacco in Last 30 Days

According to GATS-09 report, in India around 65% people with age more than or equal to 15 years had *not* consumed tobacco in last 30 days, while this proportion was highest in Goa followed by Punjab and lowest in Mizoram among all states.

Discussion

Universal Health Coverage is important determinant of health of Individual in the country. It not only covers comprehensive and quality health care but also involved the important component of financial protection at the individual level in health care utilization. Indian statistics using the World Health Organization we have found that indicators like hypertension coverage, diabetes coverage and cataract surgical coverage neither have numerator nor denominator reported by any national surveys. The reason for that can be attributed to the fact that in developing countries like India, the national survey are still aiming to capture only important health outcome data like IMR, U5MR, IMR, immunization coverage etc. and data on NCDs is still incomplete at national level because of the program related to it (NPCDCS) is relatively new.

Although basic indicator like Coverage of improved water was in nineties but maternal and child health indicators had a very poor coverage except skilled attendance at birth which has just crossed 80% level. When we compared state wise among EAG states Chhattisgarh and Odisha has better indicators than other states while among Non EAG states Tamil Nadu and Kerala has higher coverage than other states. For tuberculosis almost, all states have coverage rate around 80% or above. But in HIV treatment coverage except Himachal Pradesh rest all states have coverage less than 60%. Access to improved water is more than 60% in almost all states except Himachal Pradesh. But improved

sanitation is available to less than 60% in majority of states.

From the four indicators related to maternal and child health coverage of family planning and DPT3 immunization was found to be lower than that of the South East Asia Region (SEAR). Whereas the four or more ANC visits and skilled attendance at birth was found to be higher than the South East Asia Region. [6] The currently reported coverage was also found higher than that reported by Campbell et al. for all Low and Middle Income countries. [20] Maternal and child health services although received special attention in recent years but the progress was mainly in institutional delivery and skilled attendance at delivery. This is mainly attributed to the Janani Suraksha Yojana (JSY).[21] Improvement of these services was poor in the EAG and north eastern states which could be attributed to the difficult terrain in these areas, non-availability of institutional delivery facility, poor referral mechanism and poor penetration of health services.[22] The main reason being the poor political will which is evident from poor surveillance, monitoring and inadequate training of human resources.[23] Tuberculosis is one of the well-implemented programs with coverage more than 80% in almost all states. This was found to be higher than the coverage of tuberculosis in SEAR (54%) as reported by Global Tuberculosis Report. [24] This higher coverage can be attributed to well managed and planned program, political will as well as Information Education Communication activities.[25] HIV treatment coverage was found to be as low as 37% in India. This was lower than that reported in SEAR (39%) and also throughout the world (46%).[26] This low prevalence of ART may be attributed to treatment strategy previously adapted in India i.e. treatment below CD4 count 350. According to the recent guidelines, Anti-Retroviral Therapy (ART) is started regardless of CD4 count (test & treat).[27] Preventive chemotherapy against filariasis DEC was given in few states according to the national guidelines. Although the coverage was very high in these states, compliance to the drug was questionable.[28,29] Coverage of improved water in SEAR was found to be similar to that of India. But coverage of sanitation was found to be higher than the SEAR region.[6] Poor supply of improved water and sanitation was directly linked to political support and will.

Achievement of UHC lies on pillars of affordable and efficient health system with access to relevant medicines, and sufficient human resources for the health system. Majority of this depends on the political will and efficiency.[30] According to Economic survey of India 2016-17, total expenditure in health was around 1.4% of the GDP which is very low as compared to other South East Asian counterparts and that proposed by HLEG.[31]

This study was limited by the fact that the study has not focused on the equity measures and also using different sources for creating source of some indicator.

Conclusion

India has many national level surveys which can be utilized to generate indicators for tracking the health related indicators. This shows a gap in the requirement and availability of indicators for UHC. For many of the indicators there is no appropriate survey and for many there is duplication of records. Because of the lack of data, it is not yet possible to compare the UHC service coverage index across key dimensions of inequality. Until these data gaps are overcome, inequalities in service coverage cannot be assessed. In India none of the indicators have 100% coverage including basic like water and sanitation. For many indicators like skilled attendance at birth, Tuberculosis cure rate, preventive chemotherapy against NTD and access to improved water has achieved minimum acceptable level of 80% but still a lot needs to be done. While state wise results show a wide variation in the coverage of various services, but the difference between the EAG and Non EAG states looks blurred

Table-1: Definitions of Indicators for UHC coverage with their availability in Surveys/ National Reports

Indicator		Components	Reference Source used	Other Sources
Family planning coverage with modern methods	N	Sexually Active women 15 -49 years who are using a modern contraceptive method	NFHS-4 (2014)	DLHS-4, AHS
	D	Women 15- 49 years of age who are sexually active and don't wish to become pregnant		
Antenatal care coverage	N	At least 4 visits to any care provider during pregnancy	NFHS-4 (2014)	DLHS-4, AHS
	D	Live births		
Skilled birth attendance	N	Live births attended by skilled health personnel	NFHS-4 (2014)	DLHS-4, AHS
	D	Live births		
DPT 3 Coverage among 1 year olds	N	1 year old children who have received 3 doses of vaccine containing DPT	NFHS-4 (2014)	DLHS-4, AHS
	D	1 year old children		

Prevalence of no smoking in past 30 days among adults age >= 15 years	N	Adults 15 years and older who have not smoked tobacco in past 30 days	GATS (2009)
	D	Adults 15 years and older	
Percentage of population using improved drinking water sources	N	Population living in a household with drinking water from: piped water into dwelling, plot or yard; public tap/stand pipe; tube well/borehole; protected dug well; protected spring; or rainwater collection	NFHS-4 (2014)
	D	Total population	
Percentage of population using improved sanitation facilities	N	Population living in a household with: flush or pour-flush to piped sewer system, septic tank or pit latrine; ventilated improved pit latrine; pit latrine with slab; or composting toilet	NFHS-4 (2014)
	D	Total population	
Preventive chemotherapy (PC) coverage against (NTDs)	N	People requiring PC who have received PC (at least one NTD)	NVBDCP annual report
	D	People requiring PC (at least one NTD)	
Antiretroviral therapy coverage	N	People who are currently receiving antiretroviral combination therapy	HIV estimates 2015
	D	People living with HIV	Annual report of NACP-2016
Tuberculosis treatment coverage	N	New cases of TB that have been diagnosed and completed treatment in a given year	Annual report RNTCP-2015
	D	New cases of TB in a given year	
Hypertension coverage	N	Adults 18 years and older currently taking antihypertensive medication	NA
	D	Adults 18 years and older taking medication for hypertension, with systolic blood pressure ≥ 140 mmHg, or with diastolic blood pressure ≥ 90 mmHg	NA
Diabetes coverage	N	Adults 18 years and older currently taking medication for diabetes (insulin or glycaemic control pills)	NA
	D	Adults 18 years and older taking medication for diabetes or with fasting plasma glucose ≥7.0 mmol/l	NA
Cataract surgical coverage	N	Adults 50 years and older who have received bilateral cataract surgery or who have received unilateral cataract surgery with operable cataract and visual acuity < 6/18 in the un-operated eye	NA
	D	Adults 50 years and older with bilateral operable cataract and visual acuity < 6/18, who have received cataract surgery in both eyes, or who have received cataract surgery in one eye and have operable cataract with visual acuity < 6/18 in the un-operated eye	NA

N- Numerator, D- Denominator, NA- Not Available,

NFHS- National Family and Health Survey, DLHS- District Level Household and Facility Survey, AHS- Annual Health Survey,

RNTCP: Revised National Tuberculosis Control Program, NVBDCP: National Vector Borne Disease Control Program, NTD: Neglected Tropical Diseases

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ORIGINAL ARTICLE

Adherence to Medications among Patients with Diabetes Mellitus (Type 2) at Ballabgarh Health and Demographic Surveillance System: A Community Based Study

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Abstract

Introduction: Burden of diabetes mellitus in India is on rise. Adherence to treatment is essential to diabetes control and prevention of complications. **Objectives:** To study the adherence to treatment of diabetes mellitus and its determinants among rural population **Material and methods:** A cross-sectional study was conducted in a rural community of north India. From a list of all self-reported diabetics (aged ≥18 years), 400 were randomly selected. Information about drug prescription and intake, socio-demographic factors, health seeking behaviors and disease status were obtained from the participants. Height, weight and blood pressure were recorded. Blood samples were collected to measure HbA1c levels **Results**: Out of 371 self-reported diabetic patients, 113 (30.4%) did not take any medication since last one month of the interview. Amongst 258 patients, who were taking treatment, 146 (39.4, 95%CI: 34.5-44.4) were found to have 100% drug adherence rate. Tobacco (p=0.03) and alcohol (p=0.04) use were significantly associated with drug adherence on bi variate analysis. Drug adherence rate was higher in group with HbA1c level more than 6.4gm%. **Conclusion:** A high proportion of diabetic patients were not adhering to the treatment prescribed to them by their consulting doctors. There is urgent need for awareness generation about diabetes treatment adherence and developing adherence monitoring mechanisms at community level.

Key words: Adherence, diabetes mellitus, Rural India

Introduction

The number of people with diabetes mellitus in India is increasing across geographic, ethnic and administrative boundaries.[1-5] The International Diabetes Federation estimates that the number of diabetic patients in India more than doubled from 19 million in 1995 to 40.9 million in 2007, projected to increase to 69.9 million by 2025.

As per WHO, average rate of non-adherence in patients with chronic disease is 50% in developed countries.[6]Adherence is the single most important modifiable factor that can render even best treatment ineffective.

Most of Indian studies on treatment adherence among diabetics' are hospital based.[7-8] Present study was conducted to know treatment adherence amongst diabetics and its association with various factors in a rural community.

Material and Methods

It was a community based cross-sectional study conducted at Ballabgarh Health and Demographic Surveillance System (HDSS) site.[9] Study Population was self-reported diabetics aged > 18 years with records in Ballabgarh HMIS.

Sample size of 400 was calculated taking prevalence for adherence to diabetic treatment as 35%[10] with 5% absolute error and 15% refusal. Amongst 616 total diabetics in HMIS, 400 were selected randomly. All sampled adults were contacted at household. Information on was self-reported and obtained on pre-designed questionnaire. One-month treatment record was checked for the completion of the findings

Drug adherence was determined by both recall and pill count method. To minimize recall bias, drug intake was asked for last one week only. In recall method, patients were asked to recall individual drug intake in last one week

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prior to interview. Adherence to drug was calculated by dividing drug consumed with drug prescribed. Adherence was reported in the form of percentage. Patient was categorized as adhered to medication only if adherence was 100% by recall method. We have also calculated adherence by using pill count. Empty blister packs were counted for prescribed medications to estimate the drug intake. The reference period for pill count was one week. Taking no treatment despite being prescribed and missing even a single pill was considered as non-adherent. Fasting Blood sample was collected. Blood samples were analyzed for HBA1C estimation in the laboratory at Civil Hospital Ballabgarh. American Diabetic Association (ADA) Criteria was utilized for classification of HbA1C levels. Information about drug prescription and intake, socio-demographic factors, health seeking behaviors and disease status were obtained from the participants. Height, weight and blood pressure were recorded. Data was entered in Ms Excel and analyzed using STATA. t test was used for continuous variables and Chi square test was used for categorical variables.

Ethical clearance for the study was obtained from ethical committee of All India Institute of Medical Sciences, New Delhi.

Table 1: Demographic Profile of the study participants

		Total (371)		Adherence (146)		p Value
Category	**Sub-Category**	**N**	**%**	**N**	**%**	
Age Group	18-45 years	72	19.4	27	37.5	0.78
	46-60 years	142	38.3	54	38.0	
	>60 years	157	42.3	65	41.4	
Sex	Male	194	52.3	68	35.1	0.08
	Female	177	47.7	78	44.1	
Presence of Health Facility	Primary Health Centre	127	34.2	51	40.2	0.95
	Sub Centre	129	34.8	51	39.5	
	No Health Facility	115	31.0	44	38.3	
Caste	General	138	37.2	48	34.8	0.23
	Backward	180	48.5	80	44.4	
	SC/ST	53	14.3	18	34.0	
Occupation	Dependent	141	38.0	59	41.8	0.21
	Housewife	130	35.0	55	42.3	
	Currently working	100	27.0	32	32.0	
Education Level	Illiterate	154	41.5	64	41.6	0.36
	Primary	58	15.6	18	31.0	
	Secondary	133	35.8	56	42.1	
	Graduate & above	26	7.0	8	30.8	
Tobacco Consumption		148	39.9	48	32.4	0.03
Alcohol Consumption		59	15.9	16	27.1	0.04

Results

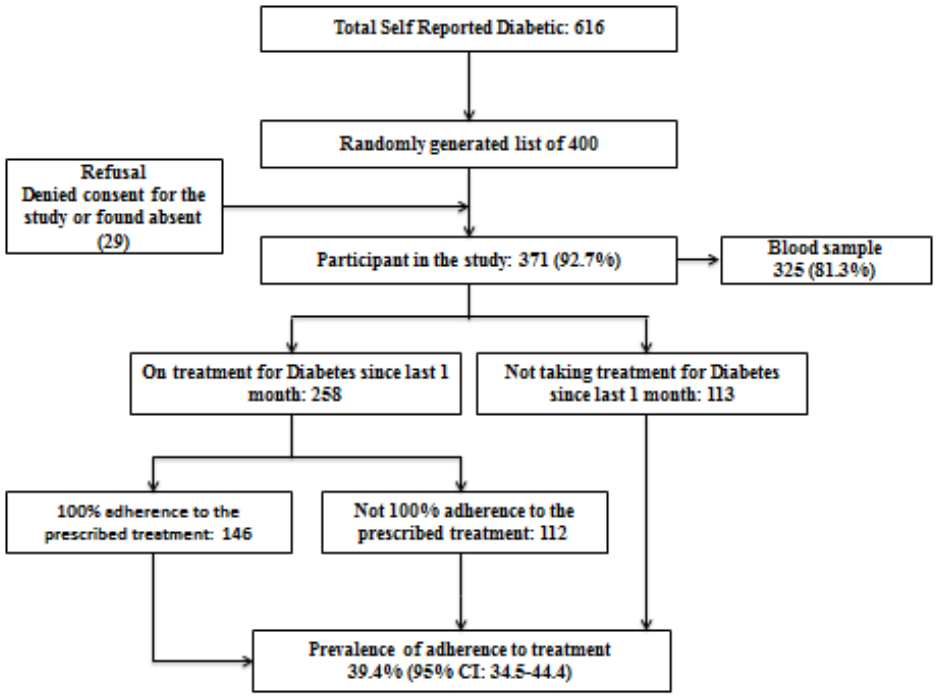
Demographic details of study participants are given in Table 1. Out of total 371 study subjects, 325 (87.6%) blood samples were collected. Amongst 371 participants, 258(69.5%) had taken treatment for diabetes in last 1 month. Prevalence of drug adherence among all diabetics with recall method was 39.4% (95% CI 34.5-44.4). Amongst 258 study participants, who had taken

Table 2: Adherence to treatment of DM with level of BMI, Duration, HbA1C and co morbidity of Hypertension

Category	Sub-category	Total (371)		Adherence (146)		
		N	**%**	**N**	**%**	**p Value**
BMI Category	Underweight (< 18.5)	35	9.4	14	40.0	0.97
	Normal (18.5 – 24.9)	190	51.2	73	38.4	
	Overweight (25 – 29.9)	101	27.2	40	39.6	
	Obese (>=30)	45	12.1	19	42.2	
Duration of DM	<1 year	74	19.9	20	27.0	**0.02**
	1-3 years	113	30.5	40	35.4	
	4-5 years	59	15.9	29	49.2	
	>5 years	125	33.7	57	45.6	
HbA1c** (n=325)	<5.7	40	12.3	11	27.5	0.27
	5.7-6.4	48	14.8	18	37.5	
	>6.4	237	72.9	100	42.2	
Hyper-tension***	Normal	42	11.3	19	45.2	0.64
	Pre-Hyper-tensive	107	28.8	42	39.3	
	Stage1 HTN	124	33.4	51	41.1	
	Stage 2 HTN	98	26.4	34	34.7	

*DM – Diabetes Mellitus, BMI – Body Mass Index, ** HbA1C categorization was done using American Diabetic Association (ADA) Criteria. *** JNC 7 Criteria was used for classification of Hypertension

Figure 1: Flow of study participants



any treatment for diabetes in last 1 month, 146 (56.6%, 95% CI: 50.5-62.5) had 100% adherence to the prescribed medicines for last seven days. The prevalence of drug adherence among diabetics with pill count methods was 39.2% (95% CI: 34.4-44.7).

Females (had a better drug adherence compared to males (44.1% *Vs*35.1%). Prevalence of drug adherence among tobacco and alcohol users was 32.4% and 27.1% respectively. A statistically significant association was found between tobacco consumption (p value=0.03) and alcohol use with drug adherence (p value=0.04). (Table 2)

With increase in duration of DM, adherence increased and it was statistically significant (p=0.02). Highest adherence rate was observed for HbA1c level of >6.4gm% while the lowest was with HbA1c level <5.7 gm%, Adherence to diabetic drug increased with increasing HBA1C, though it was statistically non-significant.

Highest drug adherence was observed for insulin (93.3%; 14) followed by Tab. Glimiperide (59.4%; 82), Tab. Metformin (56.2%; 127) and Tablet Glibenclamide (53.8%;7). Amongst 112 participants who were found non adherent to the diabetic drugs, forgetting to take drug was the most common reason for non-adherence followed by feeling of bitterness (30.6%), non-availability of drugs (13.9%), fear of side effects of the drugs (13%) and financial constraints (2.8%). 7% did not respond to the question.

Mean HbA1c level amongst those who had taken any treatment in last one month was 8.57 compared to 8.14 among those who were not taking any medicine. In the group who were taking treatment, mean HbA1c level was 8.57 among the drug adhered group as compared to 8.58 in non-adherence group.

In multivariate analysis with gender, caste, alcohol consumption, tobacco use, numbness, giddiness, polydypsia and medical prescription, none were found to be statistically significant. The R square value for the model was 0.08. Almost similar results were found during the sensitivity analysis where pill count method.

Discussion

Present study reported 39.4% adherence to the treatment of diabetes mellitus in the rural community. A systematic review[10] of adherence to medication for diabetes both in developing and developed countries showed average adherence to oral hypoglycaemic medications from 36% to 93%, which might be due to different method of measurement.

Shobhana R et al[11] in hospital-based study in Chennai reported 25.0% adherence to the therapeutic regimen lesser then values reported in our study. In a study in a tertiary teaching centre in New Delhi, medication adherence was estimated with a 4-item Morisky scale was good (Morisky score ≥3) in only 47.7% of patients.[12] Higher adherence rate in this study might attribute to hospital based setting. A community study forms rural area in Thiruvananthapuram, Kerala reported 26% adherence

to diabetic treatment.[13] This lower prevalence in this study might be due to two weeks recall period as compared to one week in the present study.

Low education status, female gender and low income were documented as factors responsible for non-adherence to the treatment of diabetes.[11] Due to inadequate sample size these relationship were not statistically significant in the present study. Association of uncontrolled diabetes status and adherence to the treatment was also non-significant in this study. In this study, adherence to the treatment was studied for a recent one week period. Hence there might be chance that recently non-adherent participants might have good glycemic control in previous three months which was reflected in HbA1C levels or those with mild diabetes might be reluctant to take drugs.Major reasons given by the patients for missing doses were symptom free period and non-availability of drugs due to lack of purchasing power comparable with various published studies[11-13]

Strengths of this study were community setting and short duration of recall period. Due to limitation of recall method adherence measurement in this study was done by two different methods which showed almost similar results. Limitation of this study was less power to document impact of adherence on diabetes control.

Conclusion

Present study documented the low prevalence of adherence to treatment of diabetes mellitus in rural community of north India (Ballabgarh HDSS). Low adherence to treatment in the context of increasing burden of Diabetes mellitus adds to the major public health problem in the country. There is a need to focus on measure to increase compliance to DM treatment through multipronged public health approach under national program for control of cancer, diabetes, CVD and stroke (NPCDCS) in India.

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ORIGINAL ARTICLE

Awareness and Willingness to Pledge for Eye Donation among Adult Population of an Urban Re-settlement Colony of Delhi

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Abstract

Introduction: Blindness is one of the major public health problems in India. Visual rehabilitation by corneal transplantation remains a major treatment option in those who are already blind due to corneal diseases. To combat with shortage of corneal donation in India, spreading awareness among masses regarding eye donation becomes important. **Objectives:** (1) To determine the awareness regarding eye donation amongst adults (>20 years) in an urban re-settlement colony of Delhi. (2) To assess their willingness to pledge for eye donation. (3) To determine the factors influencing their decision for eye donation. **Material and Methods:** This was a cross sectional study, conducted in the urban health centre attached to a medical college of Delhi between October to December 2013. Systematic random sampling was used and every alternate adult patient >20 yrs attending the UHC was recruited. Data entry and analysis was done using SPSS by a single investigator. **Results:** Majority (84.4%) had heard of eye donation. Only 21.2% were aware about contraindications for donating eyes. A little over quarter (27.6%) had heard of eye bank facility. When asked whether the retrieved eye can be stored before transplantation, majority (59.2%) didn't know. More than half (54%) didn't know which part of eye is removed. Mass media was major source of information in three forth respondents (74.9%). 45.5% were willing to pledge their eyes, a similar proportion was not willing (44.1%), five (2.4%) had already pledged and 17 (8.1%) were yet undecided to pledge. **Conclusion:** While majority of participants had heard of eye donation, but their knowledge regarding certain aspects of eye donation was found to be poor.

Key words: Awareness, willingness, eye donation, adults, cornea

Introduction

Blindness is not only an economic and social problem but also a health problem and may result in premature death. Corneal diseases are important causes of visual impairment and blindness in developing countries including India. Globally, major causes of corneal blindness include trachoma, corneal ulceration followed by xerophthalmia due to vitamin A deficiency, ophthalmia neonatorum, and the use of harmful traditional medicines, onchocerciasis, leprosy, and ocular trauma.[1-4]

Though the most cost-effective way to prevent corneal blindness are preventive strategies, visual rehabilitation by corneal transplantation remains a major treatment option in those who are already blind due to central corneal opacity.

Eye donation is purely voluntary. Voluntary eye donation is possible only after persons realize their social responsibility towards the corneal blind. There is an acute shortage of corneal donation in India. According to the Eye Bank Association of India, the current cornea procurement rate in India is 22,000 per year. It is estimated that a significant proportion of donor corneas are unsuitable for corneal transplantation.[5] Based upon our current ratio of available safe donor eyes, we would need 277,000 donor eyes to perform 100,000 corneal transplants in a year in India.[6]

Awareness amongst the general masses needs to be improved so that more number of people volunteer themselves for eye donation.

Objectives

The study was conducted with the following objectives:

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1. To determine the awareness regarding eye donation amongst adults (>20 years) in an urban re-settlement colony of Delhi

2. To assess their willingness to pledge for eye donation.

3. To determine the factors influencing the decision for eye donation among the study subjects

Material and Methods

This study was conducted in the urban health centre attached to a tertiary care hospital and medical college of Delhi between October and December 2013. Special OPD for ophthalmology was being conducted at this centre once a week. This was an observational, cross-sectional study undertaken to collect information regarding awareness and knowledge regarding eye donation from adults above 20 years of age and attending the urban health centre.

The sample size for this study was calculated taking 70.5% as awareness of eye donation from a study done in Chandigarh, North India with 10% precision level and 95% confidence level. Using a design effect of 1.5, the sample size derived was 245. We planned to enroll 250 study subjects. Systematic random sampling was used and every alternate adult patient >20 yrs attending the UHC was recruited. Informed consent was taken.

The semi-structured questionnaire was developed using previous published reports[1,5,7]. The flow content and face validity was done though an iterative process involving all the authors and also pilot testing in a small sample who have not been included in the final sample. The questionnaire was administered by a single investigator.

A pre-tested, semi-structured questionnaire which was used for data collection contained 15 items to gather information on socio-demographic profile, 12 items on awareness and knowledge about various aspects of eye donation and 5 items on willingness for eye donation. The socio-demographic profile contained basic questions on their name, address, age, sex, marital status, religion, type of family education, occupation, income, Socio-economic status etc.

The awareness section included basic questions on whether they had heard of eye donation, knew of a person who has pledged for or donated eyes, purpose of eye donation, when does eye donation happen, heard of any eye bank facility nearby, whether the retrieved eye can be stored before transplantation, whether there is a shortage of eye donation in India, what is removed during the process of removal of eye after death and the sources of information on eye donation.

The section on willingness for eye donation enquired whether they were willing to pledge their eyes for donation, whether approval of close relatives/friends was necessary in one's decision to donate eyes, what was the age when people can pledge for eye donation, what were their reasons for donation of eyes, if not what were the perceived reasons for not pledging to donate eyes.

Data was entered in SPSS version 12 by a single investigator. Descriptive statistics was used. Chi square test was used as appropriate. Level of significance was kept at 5 %.

Results

A total of 250 adults were recruited with a response rate of 100%. The socio – demographic profile has been presented in Table 1. The mean age of the participants was 39.9± 13.8. years and range of 22 to 85 years. The participation from both the genders was nearly equal, with 128 (51.2 %) males and 122 (48.8%) females. Majorities (91.2%) were married and only 4.8% were unmarried. Similarly, majority (86.8%) belonged to Hindu religion followed by Muslims (8.4%) and Sikhs (4.0%). There was a slight preponderance of nuclear families (55.2%) over joint families (44.8%).

Table 1:Socio demographic profile of participants (n=250)

Sex	Frequency	Percentage
Male	128	51.2
Female	122	48.8
Marital Status		
Unmarried	12	4.8
married	229	91.6
widowed	8	3.2
divorced	1	0.4
Religion		
Hindu	217	86.8
Muslim	21	8.4
Sikh	10	4.0
Christian	2	0.8
Type of Family		
Joint	112	44.8
Nuclear	138	55.2
Education		
Illiterate	58	23.2
Just literate	15	6.0
Primary	32	12.8
Middle School	57	22.8
High School	43	17.2
Sec School	23	9.2
Graduate	19	7.6
PostGraduate	3	1.2

Socio economic status		
Upper	1	0.4
Upper middle	40	16.0
Lower middle	66	26.4
Upper lower	132	52.8
Lower	11	4.4

Nearly one fourth (23.2%) of the study subjects were illiterate while rest were literate. The proportion of graduates (7.6%) and postgraduates (1.2%) was very small. Almost half (52.8%) of the study subjects belonged to upper lower socio-economic status while a quarter (26.4%) belonged to lower middle socio-economic status.

Majority (84.4%) had heard of eye donation but when asked whether they knew any person who had pledged for eye donation, only 17 (6.8%) had replied in affirmative. Out of these 17, six each of their relatives and friends and five family members had pledged for eye donation.

When asked about the time period when the eyes could be retrieved after death for eye donation, only one person knew while others were not aware.

When asked about contra-indications for eye-donation, only 21.2% were aware while rest were ignorant. A little over quarter (27.6%) had heard of eye bank facility. When asked whether the retrieved eye can be stored before transplantation, majority (59.2%) didn't know, only 21.2% knew and the rest (4.0%) said no.

The subjects were questioned regarding shortage of donated eyes in our country. Majority (42.8%) knew correctly, nearly 36 % didn't know about it and the rest (5.6%) said no.

The study participants were asked about the part of eye removed during eye donation. Majority (64.0%) didn't know, 52(24.6%) said that the "Whole of the eye" is removed while only 24 (11.4%) said incorrectly that only part of the eye is removed (table 2).

The source of information for various aspects of eye donation was mass media like TV, radio in nearly three fourths (74.9%). Other sources of information were friends/relatives in 23.7%, hospital/ health staff in 18.9%, hoardings/ill boards/posters in 9.5%.

When the crucial question of willingness to pledge for eyes was asked, as many as 45.5% respondents were willing, and a similar proportion were not willing (44.1%). Only five (2.4%) persons had already pledged their eyes and 17 (8.1%) have yet to decide on pledging eyes.

Those who had already pledged and were willing to pledge were asked whether consent of close relatives or family is required before pledging. Majority (62.4%) said "yes" while the remaining (37.6%) said that it was not required.

For those who were not willing to pledge eyes (93), perceived reasons for their unwillingness was enquired. Nearly one fifth (19.4 %) said they never gave a thought regarding this issue. Twelve (12.9%) subjects mentioned that they use spectacles or had low vision and therefore not willing to pledge. Nearly 16.1 % said they were not willing to donate any of their body parts. Nearly a quarter (24.7%) said that it was unacceptable to the family. Other reasons cited include religious reasons (6), inadequate knowledge

Table 2: Knowledge about various aspects of eye donation* (n=250)

Knowledge	Frequency	Percentage
Heard about eye donation	211	84.4
Any person who has pledged for eye donation	17	6.8
Correct time after death for retrieving eyes(6hrs)	01	0.4
Contraindications for donating eyes	53	21.2
Heard of eye bank facility	69	27.6
Storage of retrieved eye before transplantation	53	21.2
Shortage of eye donation in India	107	42.8
Whole eye removed for transplantation	52	20.8

*Multiple options allowed

Table 3: Perceived reasons for not donating eyes (n=93)

Reasons	Frequency	Percentage
Not acceptable to family	23	24.7
Never gave a thought	18	19.4
Will not like to donate any body part	15	16.1
Low vision/spectacles	12	12.9
Too early to decide/too young age	7	7.5
Not acceptable by religion	6	6.5
No proper knowledge regarding eye donation	6	6.5
Will be reborn without eyes	4	4.3
No family member, relative or friend has pledged	1	1.1
Diabetic	1	1.1

about eye donation (6), too early to decide or young age (7). Four subjects thought that they would be reborn without eyes (Table 3).

No significant association was found between awareness of eye donation and sex and religion of the respondents (Table 4). However, its relation with education and socio economic status was found to be statistically significant (p<0.001). Higher level of education was also significantly associated with more willingness to pledge eyes (p<0.001).

Table 4: Distribution of participants according to their awareness for eye donation and willingness to pledge in relation to sex, education, religion and socio-economic status*

Variables	Heard of eye donation			Willingness to pledge		
	Yes	No	p Value	Yes	No	p Value
Sex						
Male	113	15	0.116	57	56	0.490
female	98	24		44	54	
Education						
Illiterate	48	25	**<0.001**	19	29	**0.017**
Upto secondary school level	142	13		66	76	
Graduate & above	21	1		16	5	
Religion						
Hindu	181	36	0.54	84	81	0.25
Muslim	19	2		8	10	
Others	11	1		9	2	
SE status						
Middle & Upper	103	4	**<0.001**	56	47	0.074
Lower	108	35		45	63	

*Chi Square test was applied

Discussion

Persons who have lost their sight because of damage to cornea can hope to regain it with corneal grafting. So far no substitutes have been developed for the cornea. Hence eye donation should be encouraged so that we are able to curb corneal blindness[8].

This study was done on 250 adults to know their awareness regarding eye donation and their willingness to do so. Majority (84.4%) of study subjects had heard of eye donation which is almost the same as reported by other authors from south India[9] and Nigeria[10] while the awareness found in our study was more when compared to some other studies.[2,11-13] Singh et al have reported an awareness of 99.4% in medical students in Delhi.[14]

Only 8.1% of study participants knew a person who had pledged his/her eyes. This shows a low level of commitment towards eye donation in the society. Eyes have to be retrieved within six hours after death of the person. The knowledge regarding this was found to be almost negligible. Only one respondent could tell the correct time for retrieving eyes after death. Other studies from south India have reported a varied level of awareness regarding this aspect ranging from 4.3% to 64%.[11,15,9]

Eligibility for donating eyes requires the person to be free from certain systemic infectious diseases like HIV/AIDS, Hepatitis B and C, syphilis; corneal diseases, ocular infections and ocular tumors etc.[16] In our study, almost one fourth (25.1%) respondents mentioned that they know about contraindications of eye donation, but the conditions named by them as contraindications were mostly their misconceptions. Most of them had a wrong opinion that people with refractive errors or cataract cannot donate their eyes. A study conducted in Delhi shows that while 85.7% final year medical students knew that corneal diseases were a contraindication to eye donation, other ocular contraindications were mentioned infrequently and none of the non-medical students could correctly tell about the contraindications.[17]

About one third respondents were aware about eye banks and one third knew that retrieved eyes can be stored before transplantation. A similar study from Malaysia shows that 36.2% participants were not aware about the provision of storage of retrieved eye.[13]

Almost half (50.7%) respondents were aware of shortage of donated eyes in India. Almost three fourth (64%) had no idea about the part removed whereas only one fifth (20.8%) said that the "Whole of the eye" is removed. Other studies have shown that 40% to 43% respondents thought that whole eye has to be removed for transplantation.[13,18] Our finding may be lower due to higher illiteracy rate (25%) among study subjects residing in an urban resettlement colony.

The major source of information for eye donation was mass media like TV and radio in nearly three fourths (74.9%). Other sources like friends/relatives (23.7%), hospital/health staff (18.9%), hoardings/bill boards/posters (9.5%) also played some role. Similar results have

been found by other investigators as well.[5,11,13-15,18,19] 48% respondents in our study were either willing to pledge their eyes or had already pledged. This is quite encouraging given the fact the study subjects belonged to an urban resettlement colony where nearly one fourth of the study subjects were illiterate. This can be further encouraged by providing health education to the community regarding the importance of eye donation. Mass media could be another way of creating awareness regarding eye donation. Different researchers have found the willingness for eye donation ranging from 27% to 85%.[5,10,12,13,15,18-21]

All the respondents who were willing to donate eyes said that they feel pleasure to help a blind person see the world again and it is considered a noble act. Similar motivational factors for eye donation have been found by Gupta et al in their study from Bangalore.[15]

8% participants in our study were undecided about pledging eyes and said that they needed more time to think about it. This proportion is smaller as compared to that reported by authors from south India where almost half of the respondents were undecided about the same.[19]

44.1% were not willing to pledge their eyes. Non acceptability by family was cited as the major reason by almost one fourth respondents. Thus, family has an important role in influencing one's decision regarding eye donation in our study area. Objection by family members was found to be reason for not pledging their eyes in 28% participants in another study from India.[15] Nearly one fifth (19.4 %) said they never gave a thought regarding this issue. This shows the need to educate and motivate masses regarding eye donation. 16.1% were unwilling to pledge their eyes because they did not like to separate any body part after death and wanted their body to be intact. This was found to be the most common reason for not donating eyes by authors from Ethiopia[12] and Singapore.[21] Use of spectacles or low vision was also considered as reason for not pledging eyes (12.9%) which is a misconception as is the case with diabetes (1.1%). A small proportion of respondents (4.3%) also had belief that if they donate their eyes after death, they will be reborn without eyes. Unacceptability by religion and lack of proper knowledge were also the reasons thereby indicating the need for spreading knowledge regarding this issue. Similar reasons have also been found in other Indian studies.[2,14,15]

The awareness regarding eye donation was found to be more among males as compared to females but this difference was not statistically significant (p=0116). However, increase in the level of awareness with higher education level (p=0.000) and higher socio economic status was found to be statistically highly significant (p=0.000). As far as willingness for pledging eyes is concerned, only level of education was having statistically significant association which is in accordance with the results of some other studies as well.[19,20] However, one study from Delhi showed no relation between education and willingness to donate eyes.[2] In this study, we have found no significant association of religion with awareness or willingness to pledge eyes which has been found in another study from Hyderabad.[5]

Our study has a few limitations. It was a health centre based study. Study sample was taken from the people who visited the Urban Health Centre which may not be a true representation of the community. We did not exclude the persons who had contra-indications for donating eyes like HIV/AIDS, hepatitis B, retinoblastoma, bacterial or fungal keratitis, bacterial or fungal endothalmitis, leukemia and those undergone laser photo-ablation surgery.

For people who claimed to have already pledged for eye donation, their donation card could not be checked and we relied on their verbal commitment in doing so. This was a very small proportion out of almost half of respondents who were willing to pledge their eyes. The obstacles felt by people, who were willing to pledge but had not actually done, also need to be explored preferably by qualitative studies like focused group discussions and in depth interviews.

Conclusion

While majority of participants had heard of eye donation, but their knowledge regarding certain aspects of eye donation like time period after death for retrieving eyes, contraindications for eye donation, eye bank facility etc. was found to be poor. The major source of information was mass media like TV and radio. Almost half of respondents were willing to pledge their eyes but only 2.4% had actually done so. The main reasons for not pledging eyes were non approval by family, personal wish not to donate any body part, having low vision or simply never giving it a thought. The awareness regarding eye donation and willingness to pledge eyes was more in those with higher level of education and higher socio economic status. However, we found no relation of religion with it.

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ORIGINAL ARTICLE

Microbial Contamination of Mobile Phones of Health Care Providers at a Teaching Hospital in a Hilly North Indian State

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Abstract:

Introduction: Mobile phone is a ubiquitous device used in health care settings as well. Its frequent handling, closeness to the body and heat generated during functioning provides a favourable environment for microbial contamination and growth; as well as opportunities for their transfer from one person to another through health care provider. **Objective:** To investigate whether health care workers mobile phones carry microbes and to identify areas or health personals where this was more common. **Material and methods:** A cross sectional study was conducted at a medical college and its associated hospital in a northern hilly state of India to determine the prevalence of microbial contamination of mobile phones used by health care providers. Doctors, Nurses, Laboratory Technicians and Medical Interns were contacted at their place of work to collect swab samples from their mobile phones. Sample collection sites included out-patient clinics as well as in-patient wards, emergency department and intensive care unit. All health care providers available at the time of visit to these departments were included in the study. Swab samples collected were immediately transferred to microbiology department where overnight incubation in peptone water at 37^0C followed by culture and appropriate testing to identify organisms was done. **Result**: A total of 100 swab samples were collected, 28 from doctors, 20 from nurses, 25 from technicians and 27 from medical interns. All of them except one showed growth. Single growth were 56 while 43 cultures had multiple growths. Organism of medical importance isolated included *Coagulase Negative Staphylococci* (CoNS), Methicillin Resistant CoNS, Methicillin Resistant *Staphylococcus aureus* (MRSA), *Klebsiella*, *S. aureus, E.coli* among others. **Conclusion:** Almost all mobile phones were contaminated, more than half of whom were harbouring pathogenic micro-organisms. It could be a major threat to the health care providers as well as patients in form of nosocomial infections.

Key words: Microbes, Mobile phones, Nosocomial infection

Introduction

Mobile phone is an electronic device which is frequently touched but not usually cleaned. Its use has increased tremendously over the last two decades. They have indeed become integral part of life now days. Mobile phone comes into close contact with contaminated human body parts like hands and other areas like mouth, nose and ears. Combination of constant handling and the heat generated by the mobile phones creates very conducive breeding ground for many microorganisms that are normally found on the skin. Some studies have found that mobile phones are dirtier than a toilet seat or the bottom of the shoe.[1] In health care settings their usage by health care workers during patient care may lead to contamination of mobile phones by pathogens.[2] These microbes can then get transferred from one patient to another through health care provider which may result in nosocomial infection.[3,4] Areas like Intensive care units (ICU) and inpatient units may be the most susceptible places for nosocomial infection in health care settings as patient remain there for extended period of time with possibly compromised immunity. As mobile phones are not usually cleaned, pathogen may remain for a long period on the surface of the mobile phone. Such surfaces may become long term source of transmission endangering, not only the patients but also health care workers themselves.[5]

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Nosocomial infections are potentially preventable causes of mortality and morbidity in health care facilities. It is estimated that roughly 1.7 million nosocomial infections, from all types of microorganisms, cause or contribute to 99,000 deaths each year in the United States of America alone.[6] In another study in USA about 8.7% of hospitalized patients had nosocomial infections.[7] In India studies have mostly reported nosocomial infection in the critical care unit settings like various intensive care units (ICUs); the prevalence of nosocomial infections varies from 4.4 to 33.5 per 100 patients according to these studies.[8-13] A systemic review and meta-analysis reported the overall prevalence of nosocomial infections to be 15.5 per 100 patients in developing countries.[14] This figure is about twice as high as reported for Europe.[15] In intensive care units, the same study reported the prevalence to be 34.2 per 1000 patient days which is about thrice as of that reported in USA.[14,15] These findings imply that nosocomial infections are likely to be a significant contributor to morbidity or mortality in hospitalized patients in India.

The present study was therefore undertaken to investigate whether health care workers mobile phones carry microbes and if they do, to what extent these microbes belongs to the group of organisms known to cause nosocomial infections. Also this study wanted to identify areas or health personals where this was more common.

Material & Methods

Study setting: A tertiary care health facility which is also a teaching medical college in Kumaun region of the Uttarakhand state was the site of this study. Twelve different clinical settings were identified from where the samples were collected. These departments were then consolidated into four broad categories to facilitate comparison. The consolidated categories were – Outpatient clinics (OPDs), In-patient wards including emergency and ICU, Laboratories and pre-/para-clinical departments.

Sample size: Based on a study conducted in tertiary care health facility in Delhi, we assumed prevalence of colonization on mobiles phones to be 60 per cent and took precision of 10 per cent.[16] Using the formula $4pq/ d^2$, where p is expected prevalence, q is compliment of p, and d precision. Sample size of 96 was estimated for this study. It was rounded off to 100.

Study duration: This study was conducted from January 2016 to May 2016.

Inclusion criteria: Those health care workers who were using mobile phones on a regular basis and had their mobile phone with them on the day of visit were included in this study. Only health care workers who were Doctors, Nurses, Interns or Lab Technicians were included in this study. Other health workers were not included in the study (e.g. pharmacists, ward boys etc.).

Sample collection and transportation: For collecting samples, areas of hospital were pre-identified as mentioned above. Visits were made to these areas according to specified schedule on pre-specified days. All health care personnel present in the department/ area on the day of visit and meeting inclusion criteria were contacted and swab samples taken from their mobile phones. Samples were collected by a trained microbiologist using sterile cotton swab sticks moistened by sterile normal saline. The swab sticks were rubbed all over the surface of mobile phones. Collected swab samples were immediately transported to the Microbiology Laboratory, Govt. Medical College, Haldwani for processing.

Sample Processing: The collected swabs were incubated in test tubes containing sterile peptone at 37^0C aerobically for 18 to 24 hours in the Laboratory. After overnight incubation, the peptone water were observed for turbidity and sub-cultured on Blood Agar and MacConkey Agar and plates were further incubated overnight aerobically at 37^0C. After overnight incubation of Blood agar and MacConkey agar, colony morphology were noted followed by gram's stain, catalase test, oxidase test, motility tests and other biochemical tests were done to identify the bacteria. Antibiotic Sensitivity testing by Kirby-Bauer disk diffusion method was done as per CLSI guideline 2012.[17]

Data Management: Data was entered in Microsoft excel sheet before analysis. Statistical analysis was done using SPSS version 17. Test of significance for proportions were applied where appropriate – (Chi square test or Fisher exact test). The results are presented in percentages and proportions where appropriate.

Ethical issues: Ethical clearance for the study was taken from the institutional ethics committee of Kumaon University with the reference letter number: KUMUNI/ IBSC/ III/ I. Verbal consent was taken from all participants before collection of swab samples. Individual identifiers were removed and confidentiality of data was maintained throughout the study. After collection of swab sample, sensitization of the individuals was done towards anti-microbial resistance, nosocomial infections and advice regarding maintaining/ cleaning of mobiles phones using common disinfectants was given.

Result

A total of 100 swab samples were taken from the mobile phones of health care workers. Except one sample taken from a nursing staff's mobile phone, all samples showed growth on culture. Table 1 describes the characteristics of the people included in the study as well as the culture and sensitivity testing findings of the study.

Doctors and interns comprised of major health workers from whose mobile phones sample were taken. Laboratories were the physical sites from where most samples were

taken followed by outpatient settings and inpatient settings. Sample collected from health care providers were almost equally distributed according to the gender of the health care provider. Almost all sample showed growth on culture, only one did not. Most of the growths were single from which single organism was isolated and identified. Almost all multiple growths resulted in isolation of two organisms. Only two of the multiple growths resulted in isolation of three organisms (Table 1).

The organisms isolated in study varied from not of any significant medical importance like *Aerobic Spore Bearers* (ASB) and *Pantoea spp*. to highly dreaded and difficult to treat micro-organisms of medical importance like Methicillin Resistant *Staphylococcus aureus* (MRSA). Most common isolate was ASB followed by Methicillin Resistant Coagulase Negative *Staphylococci* (MRCoNS) (38 isolates) and CoNS (23 isolates). Almost half of samples had the isolates which were methicillin resistant (49 isolates), almost a quarter of whom were MRSA (11 isolates). *Klebsiella, S. aureus, E. coli* and *Citrobacter* were also isolated from one in every eight sample (Table 1).

The pattern of growth significantly differed according to the place of sample collection. So did differ the pattern of organism isolated from the sample swabs. These differences were, on further statistical testing, significant for samples collected from laboratories compared to those which were collected from other settings where patients were being seen. Similarly there was significant difference in the growth pattern and the pattern of isolated organisms according to the designation of health care provider. Technicians had more favourable growth pattern and pattern of isolation of organism compared to doctors, interns and nurses. However there was no statistical difference in growth pattern on culture media and pattern of organism isolated among doctors, interns and nurses. Also there was no significant site or personnel differences in distribution of clinically significant organisms isolated from the mobile phones of the health care workers in our study (Table 2).

Table1: Selected characteristics of the health care workers included in the study and the culture sensitivity findings from the samples collected from them

Domain	Characteristic	Numbers	Per cent
Designation	Doctor	28	28
	Intern	27	27
	Nurse	20	20
	Technicians	25	25
Department	OPD	33	33
	Inpatient settings	27	27
	Laboratories	35	35
	Pre and Para-clinical	5	5
Sex	Male	54	54
	Female	46	46
Growth pattern	No growth	1	1
	Single growth	56	56
	Multiple growth	43	43
Organism isolation pattern (n = 99)	Single	56	56
	Two	41	41
	Three	2	2
Micro-organism isolated	*Staphylococcus aureus* (including MRCoNS*, CoNS#, MRSA**)	75	75
	Methicillin Resistant Coagulase Negative Staphylococci (MRCoNS)	38	38
	Coagulase Negative Staphylococci	23	23
	Methicillin Resistant Staphylococcus aureus (MRSA)	11	11
	Aerobic spore bearer (ASB)	56	56
	Pantoea sp.	4	4
	Klebsiella pneumonia	4	4
	Citrobacter	2	2
	E.coli	1	1
	Klebsiella oxytoca	1	1

* Methicillin Resistant Coagulase Negative *Staphylococci*, # Coagulase Negative *Staphylococci*, ** Methicillin Resistant *Staphylococcus aureus.*

Discussion

This study was conducted at a tertiary care teaching hospital in Kumaun region of Uttarakhand. A total of 100 mobile phone swab samples from different cadre of health care workers working in twelve different clinical settings were collected, cultured and analyzed for the presence of micro-organisms. Out of the 100 mobile phones sampled in this study, 99 (99 per cent) were found to be contaminated with micro-organisms. This finding is similar to findings in studies conducted by Selim HS *et al,*Daka D *et al,* and Zakai S *et al* where reported contamination of mobile phones was 100%, 97.4% and 96.2% respectively.[18,19,20] Selim HS *et al* also had diverse group of individuals whose mobiles were swabbed like in our study but the results

Table 2: Growth pattern on culture media and those of isolated organisms according to department from where samples were taken and designation of health care worker

Culture characteristics		Sample collection - Site				p Value *
		Laboratory	Inpatient settings	OPD	Pre & Para-clinical	
Growth pattern	No growth	0	0	1	0	0.007
	Single growth	26	15	11	4	
	Multiple growth	9	12	21	1	
Organism isolated	None	0	0	1	0	0.018
	Single	26	15	11	4	
	Two	9	11	20	1	
	Three	0	1	1	0	
Clinically significant organism#	Yes	30	18	25	2	0.086
	No	5	9	8	3	
		Sample collection - Person				
		Doctor	Intern	Nurse	Technician	
Growth pattern	No growth	0	0	1	0	0.005
	Single growth	13	15	7	21	
	Multiple growth	15	12	12	4	
Organism isolated	None	0	0	1	0	0.007
	Single	13	15	7	21	
	Two	15	11	11	4	
	Three	0	1	1	0	
Clinically significant organism#	Yes	21	19	15	20	0.89
	No	7	8	5	5	

*Fischer exact test; # Clinically significant organisms were all organisms isolated in our study except ASB & CONS

are not surprisingly similar.[18] However, their sample size (n= 40) was much smaller than our study. Similar is the case with the study conducted by Daka D *et al* and Zakai S *et al* with relatively large sample sizes of 152 and 105 respectively.[19,20] However, all these studies have been done outside India. While studies conducted in India by Das D *et al*, Arora U *et al* and Kokate SB *et al* found lower rate of mobile contamination than our study.[16,1,21] They reported contamination of mobile phones to be 36%, 40.6% and 60% respectively in their studies. However, the study by Arora U *et al* does not report ASB in their study, which if removed from our study would give isolation prevalence similar to their study.[1] In the study conducted by Das D *et al* only gram positive organisms were isolated whereas our study reports both types of organism.[16] Inability to isolate gram negative organisms may have led to low prevalence of microbes in their study. Arora U *et al* also do not report gram negative growth. This may be due to delay in transportation or other factors leading to failure of growth of gram negative organisms in their study.[1] In our study, we minimized delay and adhered to protocol, we would like to conclude that we were able to isolate almost every contaminant like similar to studies done abroad.

There was almost universal contamination of mobile phone of health care workers included in our study. However, there were significant differences in the pattern of growth and number of isolated organisms according to the work place of health worker and also according to the designation of the health care worker. Laboratories and laboratory technicians were the sites and persons samples from where/ whom showed significantly less multiple growths and least number of isolated micro-organisms when statistically compared to other clinical sites or personnel. While there were no statistical differences between growth patterns or number of organisms isolated from general OPDs, emergency and ICU and general in-patient wards or the personnel working in these settings. These differences may be attributed to relatively strictly demarcated patient areas in laboratory, more consistent use of gloves and apron by laboratory workers during work and likelihood of less handling of mobile phone while working. On the other hand doctors, interns and nurses do not always wear gloves during their shift in OPDs and many patients are touched without gloves while working especially in overcrowded emergency department and OPDs. Dealing with more than one patient at one time and

not so strict demarcation of patient doctor areas in OPDs and work station in wards and emergency department may also have an effect. Movement of doctors and interns from one clinical setting to another (from emergency to ward, from ward to OPDs and so on) depending upon their duty roster on different days or even on same day may also be a factor in not having differences in organisms isolated or in their growth patterns among inpatient settings and OPDs. However, Laboratory technicians, nursing staff and pre and para-clinical department staff have reasonably demarcated areas of work for relatively longer period of time.

In our study, a total of 143 organisms were isolated. Out of these 75 (52.4%) were gram positive isolates of clinical importance (excluding ASBs). From gram positive isolates 38 were MRCoNS (50.6 %), 23 were CoNS (30 %), MRSA accounted for another 11 isolates (14.6%) and three *Staphylococcus aureus* (4%) were isolated. The result is similar to other studies in which gram positive bacteria were the most frequently isolated bacteria.[19,21,22] The isolation rate of CoNS in our study was similar to studies conducted in Amritsar by Walia SS *et al* and Arora U *et al*[1] both of which had a large sample size.[23,1] Another study done in Bhubaneswar by Pattnaik S *et al* also reported CoNS as predominant gram-positive isolate (69.2%) but this study was restricted to surgeons only which might explain the finding.[24] However, studies have reported varying prevalence of growth of MRSA. In the study by Pattnaik S *et al* only one growth (3.8%) showed MRSA while Walia SS *et al* reported 29 per cent isolates to be MRSA.[24,23] Outside India also studies have reported high prevalence of *Staphylococcus aureus* isolation from mobile phones of health care providers. For example, in the study conducted by Fauci VL *et al*, 64 per cent of the isolates were S. *aureus*, however they have not further characterized it into methicillin sensitive or resistant isolates.[25]

Only 12 isolates (8.4%) in our study were gram negative. The isolation rate of *E. coli* in our study (1%) was similar to finding of the study of done by Sharma *et al* in Rajasthan (2%) during 2014 but significantly low compared to another Indian study conducted at Amravati by Tambeker *et al* (11%).[26,3] Similar rate of *E. coli* isolation was also reported (3.6%) in larger study with sample size of 122 at a teaching hospital, Turkey by Karabay *et al* in 2007.[22] Low prevalence of *Klebsiella spp*. (5%) and *Pantoea* (4%) was identified on the mobile phones of health care workers in our study which is similar to the reported rate of isolation of *Klebsiella* (10%) by Tambekar *et al* in 2008.[3] However, in a study conducted by Zakai *et al* at King Abdulaziz University (KAU), Jeddah, Saudi Arabia, a total of 105 swab samples were collected but only 0.95% of *Pantoea spp* were isolated.[20]

Staphylococcus aureus is a well-known nosocomial pathogen especially in intensive care and surgical settings. If it is methicillin resistant it is difficult to treat and has high mortality rates. A total of 14 per cent *S. aureus* were isolated in our study. Other isolated organisms in our study which might cause nosocomial infections include *Coagulase negative Staphylococci, E. coli and Klebsiella spp.*[8-13, 27] These findings bring to prominence the role mobile phone could play in spreading nosocomial infections or the intervention which limit use of mobile phones during work by health care personnel and maintenance of mobile phone hygiene could have in preventing nosocomial infections.

At our study site, nosocomial infections are passively monitored i.e. samples are processed on receiving samples from clinical departments and findings are reported after processing in the microbiology department. On reviewing the reporting register for the period between January to mid-June 2018, we identified records for a total of 803 samples from suspected infected surgical sites from all surgical departments at the institute. Out of these 253 showed no growth. From the remaining 550 samples a total of 174 Staphylococcus aureus (31.6%) were isolated - 70 being MRSA (12.7%); CoNS isolated were 141 (25.8%) - 81 being MRCoNS (14.7%). Other isolated organisms included Entrococcus (6.4%) including five Vancomycin Resistant Enterococcus (VRE) and Streptococcus. Among gram negative organisms E. coli was most frequently isolated organism with 107 isolates (19.5%) followed by Pseudomonas with 69 isolates (12.5%), Klebsiella pneumoniae with 19 isolates (3.5%), Citrobacter with 16 isolates (2.9%) and Klebsiella oxytca with 2 isolates (0.36 %). All these organisms have been documented to cause nosocomial infection in various studies. [8-14, 27] These isolates are very similar to the organisms isolated from the mobile phones of the health care providers in our study though the proportions are different. Therefore, the possibility of mobiles phones acting as conduit for transmission of these organisms cannot be discarded.

Strengths and limitations of the study

Trained sample collector, immediate transfer of swab samples to laboratory, pre-defined schedule to visit different areas of hospital to limit convenient sampling and no refusal during the study comprised the main strengths of this study. However, all visits to collect samples were made during day shift. If the pattern of microbial contamination of health care personnel working in night shift is different to their counterparts working in day shift, this study may not be representative of them.

Conclusion

We conclude that mobile phone contamination is almost universal in health care personnel. More than half of these contaminants have potential to cause nosocomial infection. There is need to have institutional guidelines specifying mobile phone use during patient care/ work hours for the health care providers directly involved in patient care. Studies which could directly link nosocomial infections

with mobile phone contaminant may provide stronger proof of role of mobile phones in spread of nosocomial infections, our study only provides indirect support to this hypothesis.

Competing interests: Nil

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ORIGINAL ARTICLE

An Assessment of Maternal Morbidity Pattern among Reproductive Age Group Women in a District of West Gujarat: A Community Based Cross Sectional Study

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Abstract

Introduction: For each maternal mortality, there are number of various morbidities, which directly or indirectly affects health of women. For every woman who dies of pregnancy-related causes, an estimated 20 women experience acute or chronic morbidity, often with tragic consequences. **Objectives:** To assess maternal morbidity pattern, prevalence of maternal morbidity & its associated factors. **Material and Methods:** A community based cross-sectional study was conducted among 450 women of reproductive age group women of Jamnagar district. Study subjects were selected by multistage sampling. Data collected in proforma consist of sociodemographic profile, past obstetric profile & any antenatal, Intranatal, & postnatal morbidities. **Results:** Prevalence of maternal morbidity was about 80% with, highest morbidity found during antenatal period in 36% subjects, followed by 26% in postnatal period. There were also associated medical problems during pregnancy. **Conclusion:** There is 80% prevalence of morbidity related to pregnancy which adds on to ill health of women. It was also observed that statistical significance between few of the important variables like educational status, parity & place of delivery, which could be independent risk factors & occurrence of maternal morbidity.

Keywords: Morbidity, Reproductive age group, Maternal Health

Introduction

If India intends to accomplish the goal of health for all, far greater attention must be given to women's health and their roles in health and development[1] because maternal health affects the health of whole family, community and thus society. Pregnancies and child births are very special events happening in women and, indeed, in the lives of their families. This can be a time of great hope and joyful anticipation. It can also be a time of fear, suffering and even death. Bunch of programmes are focusing on prevention of the maternal mortality. The RCH services started long back, mainly focus on the Reproductive health profile. The statistics are published regarding the mortality only. While looking at various health programmes related to the reproductive health, majority of them targeted to reduce the mortality. For each mortality, there are number of various morbidities, which directly or indirectly affects health. For every woman who dies of pregnancy-related causes, an estimated 20 women experience acute or chronic morbidity, often with tragic consequences.[2] There is dearth of data available on morbidity pattern of the reproductive age group women & if available then it particularly gives largely hospital based picture, which does not give the actual scenario prevailing in the community. Keeping in view the above stated problems, there is a need of conducting study which can assess morbidity profile of reproductive women.

Objectives

- To study the prevalence of antenatal, Intranatal and postnatal morbidities amongst women in the study population.
- To study pattern of antenatal, Intranatal and postnatal morbidities.
- To study the effect of various determinants on

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maternal morbidity amongst the study population.

Material and Methods

Study area and population: The present assessment employed quantitative research methodology in rural areas of Jamnagar district of Gujarat.

Type of study: A cross sectional study.

Period of study: 1 year (July 2013- June 2014)

Sample size: Sample size of this study was decided on the basis of anticipated value of morbidity as 50%. Fifty percent of the reproductive age group women in the population might be suffering from some kind of illness at a time. As per WHO practical manual on sample size determination in health studies by Lwanga and Lemeshow[3]. $N = Z\alpha^2PQ/l^2$ Where, $Z\alpha = 1.96$ at 5% significance level, N= required sample size, P=proportion or prevalence of interest, Q=100-p, l=allowable error. So when absolute error taken as 5%, P is taken as 50%, so as q=50%.Then, sample size would be, $N = (1.96)^2 * 50 * 50/5x5 = 384.16$. Considering the non-response rate/loss of sample = 10% of sample size, total sample size came out to 422.16 study subjects, which was made in round figure of 450 study subjects**.**

Study population: The study group comprised of 450 women of reproductive age group of rural areas of study district.

Inclusion criteria:

- Ever Married, Reproductive age group women (15-49 years),
- Willing to participate
- Not Pregnant Presently

Sampling technique: Study subjects were selected by multistage sampling. Out of the total 7 blocks in the district, 3 blocks were selected randomly. Five Primary Health Centres were selected from each of the blocks by simple random sampling. From each PHC three sub centres were selected by simple random sampling method. So total 45 sub centres were selected from 3 blocks. Sub centre was taken as natural cluster. Thus total 45 clusters were selected. From the one geographically identified point, one direction was chosen randomly and from each cluster 10 women were selected and interviewed till the desired number was achieved in each cluster. So total 450 women were recruited.

Data collection: Data was collected in a pre-designed and pre-tested Proforma by interviewing woman. The study was carried out by undertaking house to house visits of the area of each cluster. Proforma consist of sociodemographic profile, past obstetric profile & any antenatal, Intranatal, & postnatal morbidities.

Ethical clearance: The study protocol was reviewed and approved by the institutional ethical committee of the institution. Prior written informed consent was taken from the paticipants after fully explaining the purpose of the study.

Data entry and analysis: The data entry was done in Microsoft Office Excel 2007. Analysis was done using Epi info and Microsoft office Excel2007 & SPSS. Chi square test was used to test the significance of difference between various variable. P value<0.05 was considered as statistical significance.

Results

Table 1: Socio-demographic profile of study subjects (n=450)

Sociodemographic Characteristics	No. (Frequency)	Percentage (%)
Age group		
15-19 Years	9	2%
20-24 Years	99	22%
25-29 Years	81	18%
30-34 Years	72	16%
35-39 Years	72	16%
40-44 Years	36	8%
45-49 Years	81	18%
Religion		
Hindu	378	84%
Muslim	72	16%
Social Class		
I	63	14%
II	81	18%
III	138	30.7%
IV	111	24.6%
V	57	12.7%
Educational Status of women		
Illiterate	198	44%
Primary	144	32%
Secondary & Higher Secondary	108	24%
Educational Status of Husband		
Illiterate	126	28.57%
Primary	140	31.74%
Secondary & Higher secondary	130	29.47%

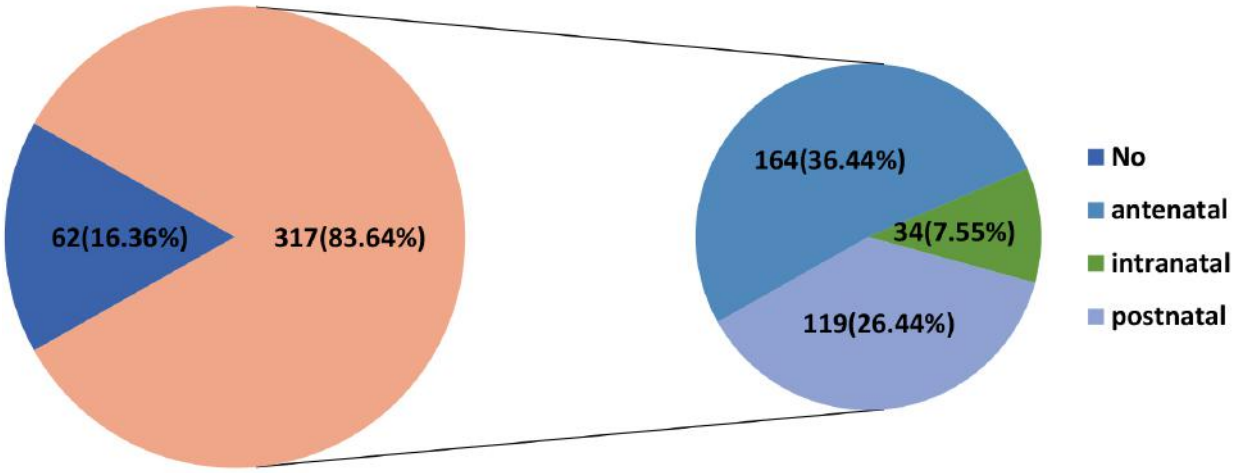

Figure 1: Distribution of women according to presence of Maternal Morbidity

Graduate & above	45	10.20%
Occupation		
Housewife	333	74%
Labourer	63	14%
Famer	54	12%
Occupation of Husband		
Business	90	20.4%
Service	81	18.36%
Labourer	180	40.81%
Farmer	63	14.81%
Other	27	6.12%

There was even distribution among various age groups of reproductive age group women except for15-19 years and 40-44 years. Majority belonged to middle and lower socio economical class. Higher literacy rate among husbands of participants (71.43%) found than females (56%).Most of the women were engaged in house hold activities (74%) where as their husbands were engaged in labour work (40.81%), some kind of business (20.40%) and farming (14.81%).

Of 450 women, 71 women did not conceive till date, thus they were excluded from the analysis & maternal morbidity variables were analysed for 379 women. Around eighty four percent of women had some form of morbidity during pregnancy, child birth and till the six week puerperium. Maternal Morbidity is one of the reasons for the reduced life expectancy of the women. Estimates of disability adjusted life-years (DALYs) provide an indicator of one part of the indirect costs, women's loss of productive life. An estimated 5 million DALYs are lost per year by women of reproductive age as a result of mortality and morbidity from unsafe abortion.[4] However, this rate probably underestimates the true burden because of limitations in the methods of estimating DALYs resulting from maternal causes.[5] Maternal morbidities could be present during antenatal, intranatal & postnatal period. Almost half of the morbidities were present during pregnancy period & half of the morbidities were present in intranatal & postnatal period.

Table 2: Distribution of women according to morbidity pattern during antenatal period (n=164)

Type of morbidity	No. (Frequency)*	Percentage (%)
Weakness	153	93.29%
Vaginal Discharge	117	71.34%
Abdominal Pain	94	57.32%
Headache	89	54.27%
Vomiting	69	42.07%
Oedema leg	62	37.80%
Fever	56	34.15%
Bleeding P/V	37	22.56%
Leaking P/V	13	7.93%
Decreased foetal movement	6	3.66%
Visual disturbances	5	3.05%
Oligohydroamnios	17	10.37%

* Multiple responses

Antenatal morbidities were most common among all the types of maternal morbidities. The most common complaint was weakness, which may be due to the dilutional anaemia, a physiological effect of pregnancy. It was found in 93.29% of study subjects. Second most common complaint was vaginal discharge in 71.34%, followed by abdominal pain in

57.32%, headache in 54.27%, vomiting in 42.07%, oedema leg in 37.80%, fever in 34.15%, bleeding per vaginum in 22.56%, leaking per vaginum in 7.93%, decreased foetal movement in 3.66% and blurring of vision in 3.05% and oligohydroamnios in 10.37% of the participants.

Table 3: Distribution of women according to Morbidity pattern during labour (Intranatal period) (n=34)

Type of Morbidity	No. (Frequency)*	Percentage
Prolonged labour	23	67.64%
Premature rupture of membrane	11	32.35%
Convulsions	3	8.82%
Foetal distress	10	29.41%
Severe bleeding	2	5.88%
Mal presentation	13	38.24%

* Multiple responses

Considering intranatal morbidities, Prolongation of labour was found in 67.64% of women, premature rupture of the membrane was present in 32.35% while 8.82% had convulsions, and 29.41% women gave history of meconium stained liquor suggesting foetal distress. Haemorrhage was present in 5.88%. On examination 38.24% were told that their pregnancy had malpresentation.

Table 4: Distribution of women according to morbidity pattern during puerperium (postnatal) (n=119)

Type of Morbidity	No. (Frequency)	Percentage (%)
Backache	93	78.15%
Pain in stitches	26	21.85%
Delayed Milk out put	33	27.73%
Infection of stitches	12	10.08%
Weakness	74	62.18%
Breast engorgement	19	15.97%
Mastitis	7	5.88%
Fever	23	19.33%
Abdominal Pain	13	10.92%
Bleeding	6	5.04%

Common post-partum morbidities found were backache in 78.15%, weakness in 62.18%, pain in stitches in 21.85 %, delayed milk output in 27.73%. Other problems were infection of stitches in 10.08 %, mastitis in 5.88% and post-partum haemorrhage in 5.04% women, while other problems like fever, diarrhoea, bleeding from tear etc. were present.

Table: 5 Distribution of Maternal Morbidity according to different variable

Variable	Maternal Morbidity		Statistics
	Yes	No	
Age Group			p Value=0.932
15-19 Years	7(2.21%)	2(1.5%)	χ^2= 1.861 df=6
20-24 Years	79(24.92%)	27(20.30%)	
25-29 Years	53(16.72%)	21(15.79%)	
30-34 Years	49(15.46%)	23(17.23%)	
35-39 Years	50(15.77%)	22(16.54%)	
40-44 Years	24(7.57%)	12(9.02%)	
45-49 Years	55(17.35%)	26(19.55%)	
Religion			p Value=0.355
Hindu	263(69.73%)	115(30.33%)	χ^2 = 0.854, df=1
Muslim	54(75%)	18 (25%)	
Social Class			p Value=0.875
I	43(13.6%)	20(15.04%)	χ^2 = 1.216 df=4
II	55(17.35%)	26(19.55%)	
III	101(31.86%)	36(27.1%)	
IV	79(24.92%)	33(24.81%)	
V	39(12.3%)	18(13.53%)	
Educational Status of women			p Value=0.875
Illiterate	137(43.22%)	61(45.86%)	χ^2 = 0.268 df=2
Primary	103(32.49%)	41(30.83%)	
Secondary & Higher Secondary	77(24.29%)	31(23.31%)	
Educational Status of Husband			p Value=0.0001
Illiterate	89(28.1%)	37(27.82%)	χ^2 = 42.119, df =3
Primary	105(33.12%)	39(29.32%)	
Secondary & Higher Secondary	92(29.02%)	43(32.33%)	
Graduate	31(9.78%)	14(10.57%)	
Contraceptive Usage			p Value=0.399 χ^2= 0.712 df=1
Place of Delivery			p Value = 0.001
Home	208(65.62%)	40(30.08%)	Chi square = 46.41, df=1

There was no statistical difference in occurrence of maternal morbidity in different age groups, religion, social class, educational status of women, except educational status of husbands.

While analysing for prevalence of maternal morbidity in various age groups, 24.92% women among age group 20-24 years had any type of morbidity, where as in other groups it was around 15% except for age group 15-19 years. It could be due to small sample size in 15-19 years who would have conceived.

Among hindus, 69.73% women had maternal morbidity, & among muslims 75% had maternal morbidity, and the difference in occurrence of morbidity was not statistically significant.

In lower socio economical class, 37.22% whereas about 49.21% women in middle class & 13.6% women in upper class respectively women suffered from some kind of maternal mortality. The difference among various social classes was not statistically proved.

More than 50% morbidities occurred in the women who had literacy status below the secondary & higher secondary class, the difference was not significant statistically.

On statistical analysis there was significant difference in occurrence of the morbidities among various education statuses of women's husbands. 61% morbidities were in women whose husbands studied up to primary class.

The difference among various groups of parity & place of delivery and the occurrence of maternal morbidities was statistically significant. Among contraceptive users, prevalence of morbidity was 68.87%, & among non-users it was 72.53%. The difference was not significant statistically. No difference in age at marriage & maternal morbidities was found.

Among overweight women, prevalence of morbidity was 61.51%, where as in underweight group it was 9.15%. Those who had normal weight prevalence were 29.34%. The difference between these groups was not statistically significant.

Maximum proportion of morbidity was found in women who had 3rd parity i.e., 31.55% the difference was statistically significant. There was no statistical significant difference in occurrence of maternal morbidity & termination of pregnancy. Place of the delivery played important role in determination of maternal morbidities. Home delivery women suffered from maternal morbidities in high proportion i.e. 65.62% while institutional delivery had 34.38% occurrence and the difference between these two groups was statistically significant.

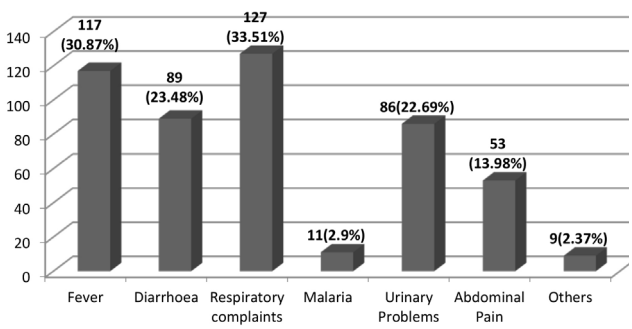

Figure: 2 Distribution of women according to any medical complication during their pregnancy :(n=379)

When looked at overall medical complications during pregnancy, 30.87% suffered from fever, 23.48% suffered from any episode of diarrhoea, 33.51% had complaints of respiratory problems, like cough, cold, throat problem, & few had lower respiratory complaints. Around 3% women were diagnosed as cases of malaria, 22.69% had urinary problems like burning micturation and 13.98% had complaints of abdominal pain. Other complaints were episode of breathlessness, jaundice etc.

Discussion

Majority i.e. 74% women were housewives and remaining of them were engaged in agriculture, & labour activities. About 40.81% of the women's husbands were labourer and remaining of them were in occupations like agriculture, service or business. Social class distribution showed half of the subjects belonged to middle class, one third belonged to lower class wereas rest of them i.e. 14% belonged to upper class. About one quarter women married before the legal age of marriage, suggesting till child marriages are in practice, which affects her health in all aspects. The same was found among their husbands i.e. around 28% married before legal age of marriage. Mean age of women at 1st conception was 17.21 years. More than half of the women conceived before the ideal age for conception i.e. before 20 years and half of the women had safe child bearing age.

In a study by Davara Kajal (2013) in the same district, about one third, i.e. 38.2% women belonged to 25-29 years age group, followed by 20.4% women in 30-34 years age group, 19% women in 20-24 years age group, and 12.2% women in 35-39 years age group.[6]

According to DLHS-1 (2011), 95.8% were Hindu and 4.2% were Muslim in the Jamnagar district.[7] Majority i.e. 60.9% belonged to Joint family, 27.1% were from nuclear family and 12% belonged to three generation family in a study by Nimavat Khyati[8] According to DLHS-1, 35.6% women were illiterate in this district.[7] According to census 2011 of India; Literacy rate of females in the same district was 65.97%.[9] In a study by Koringa Hetal (2013), 23.77% women's' husband were illiterate, while 31.33%, 22.45% and 12.23% women's husband had education up to primary level, secondary level and higher secondary level respectively. Only 10.22% women's husbands were graduate. [10] In a study by Koringa Hetal (2013) majority i.e.76.67% women were house wives. Only 12.89% were labourers, 7.33% were service class, 2% were involved in agriculture and 1.11% were involved with gainful employment. [10]

Girls who marry earlier in life are less likely to be informed about reproductive issues,[11] and because of this, pregnancy-related deaths are known to be the leading cause of mortality among married girls between 15 and 19 years of age.[12] These girls are twice more likely to die in childbirth than girls between 20 and 24 years of age. Girls younger than 15 years of age are 5 times more likely to die in childbirth.[13]

Infants born to mothers under the age of 18 are 60% more likely to die in their first year than to mothers over the age of 19. If the children survive, they are more likely to suffer from low birth weight, malnutrition, and late physical and cognitive development.[14]

According to UNICEF data, Incidence of child marriage for year 2005-2006 was 52.5% in India.[15] According to NFHS, 2005-2006, Mean age at marriage for males in rural area was 21.5 years. [15]

83.64% women had any kind of morbidity during pregnancy, child birth or puerperium. Of which 36.44% women had antenatal morbidities, 7.55% women had intranatal morbidities and 26.44% had postnatal morbidities. Most common form of antenatal morbidities was weakness in 91.62%, vaginal discharge in 71.34%, abdominal pain in 57.32%, and headache in 54.27%. Around 20-40% had suffered from various health problems like vomiting, oedema leg, fever, bleeding P/V, oligohydroamnios. Few women had complaints of visual disturbances, decreased foetal movement and leaking P/V.

Considering the intranatal morbidities, prolongation of labour was found in 67.64% of women, premature rupture of the membrane was present in 32.35%, 8.82% had convulsions, 29.41% women told had the meconium stained liquor suggesting foetal distress. Haemorrhage was present in 5.88%. On examination 38.24% were told that their pregnancy had malpresentation.

From the women who had post-partum morbidities, common morbidities found were backache (78.15%), weakness in (62.18%), pain in stitches in (21.85%), delayed milk output (27.73%). 15-19% had complaints of breast engorgement, fever & abdominal pain. Other problems were infection of stitches in 10.08%, mastitis 5.88% and post-partum haemorrhage was found in 5.04% women, while only about 2% had diarrhoea, bleeding from tear etc.

During pregnancy, 30.87% suffered from fever, 23.48% suffered from any episode of diarrhoea, 33.51% had complaints of respiratory problems, like cough, cold, throat problem, & few had lower respiratory complaints. Around 3% women diagnosed with malaria, 22.69% had urinary problems like burning micturition. 13.98% had complaints of abdominal pain.

The study conducted by Patel Neha in same district (2012) found that 302(67.11%) women had suffered from any type of maternal morbidity during their pregnancy, childbirth or puerperium. While rest 148(32.89%) did not have any morbidity.[16] The study by Neha Patel (2012) revealed that from the women, who had any kind of morbidity, 55.56% women had morbidity during their antenatal period, 20.22% women had morbidity during intranatal period and 24.44% women had morbidity during their post-partum period. [16]

Current study has higher rate of maternal morbidity than a report by WHO regional health Forum (1996), in which maternal morbidity were reported as below, maternal morbidity of the last pregnancy in 5 CHN-III Provinces, SKRT 1995.[17]

Nimavat Khyati (2013) in her study in same district found pre-eclampsia (swelling of legs and blurring of vision) i.e. 32.5%. Other health problems of women were abdominal pain -22.5%, severe weakness- 20%, severe vomiting- 10%, high fever- 10%, leaking per vaginum- 7.5%, bleeding per vaginum- 5%, severe anaemia- 5%, decrease fetal movement- 5% and early cervical dilatation- 2.5%.

Study by Patel Neha et al (2012) revealed that, from the women who had antenatal morbidity, majority had complaint of weakness (70.4%). Other morbidities found were hyper emesis gravidarum (25.2%), swelling of legs (25.2%), hypertensive Disorder (Pregnancy Induced hypertension) (14.4%), bleeding P/V (11.6%), headache (8.8%), blurring of vision (8.4%), eclampsia (1.6%) and fever with vaginal discharge (6%). [16]

Khyati Nimavat et al (2013) said women who suffered from intrapartum morbidity, majority i.e. (40.9%) women had prolonged labour, followed by premature rupture of membrane in 27.3%, convulsions in (18.1%), bleeding in (18.1%) and mal presentation in (13.6%). [8]

Patel Neha et al (2012) stated from the women who had intrapartum morbidity, major cause found were prolonged labour -34.6%, premature rupture of membrane - 31.86%, oligohydroamnios 18.68%, malpresentation- 12.08% and foetal distress-12.08%. Very few women had complaint of MAS -5.5%, polyhydroamnios -3.3% and 2.2% women suffered from primary post-partum haemorrhage. [16] The same study observed that 22.72% had backache, 18.18% had pain in stitches, Infection of stitches in 13.63%, 10% had mastitis, 9.1% had weakness as well as delayed milk output, whereas haemorrhage was found in 3.63%, and only 1% had septicaemia & eclampsia. [16]

Over all medical complication during pregnancy were 7.78% amongst the women. Out of those who had medical complications, 34.28% women had Diarrhoea during pregnancy. 22.85% women had Fever due to any medical reason during their antenatal period and 8.57% had Reproductive Tract Infections. 5.7% women had Malaria during pregnancy. 20% women had other complication like Asthma, Jaundice, Rubella, Stone etc in a study by Patel Neha et al (2012). [16]

Conclusion: Eighty percent women suffered from maternal morbidities. Educational status, parity & place of delivery could be independent risk factors. Other factors did not found statistical significant difference in occurrence of

maternal morbidity. Thus irrespective of sociodemographic variable, there is a chance of occurrence of maternal morbidity, so there is need to focus on this grey area.

Expanding the discourse around safe motherhood to use explicitly both the terms mortality and morbidity (or death and disability) would raise awareness of the need to address neglected morbidities, which have life-altering consequences for women and their families. Communities should be made aware of the hazards of utilizing untrained birth attendants for conducting delivery & simultaneously promotion of institutional delivery should be made. There is a special effort needed to map out those areas where home deliveries are high and persisting. Interventions before pregnancy can increase the health and well-being of adolescents, adult women and men, and improve subsequent pregnancy and child health outcomes.

Limitation of study: Relatively small sample size could be the limitation, for such type multicentre study should be conducted with larger sample size. Only variable of interest were included in study.

Conflict of interest: Nil

Source of funding: Nil

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ORIGINAL ARTICLE

A Clinico -Social Study of Functional Disabilities among Elderly in Palam Village of Delhi

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Abstract

Introduction: Aging, an integral part of living, typically is accompanied by gradual but progressive physiological changes and an increased prevalence of acute and chronic illness and is further compounded by impairment of special sensory functions like vision and hearing and difficulties in performing their routine daily activities seriously affecting the economic, social and psychological aspect of life of older people with disabilities. **Objective:** To estimate the magnitude of functional disability and its association with various socio-demographic variables among the elderly persons in Palam village of Delhi. **Material and Methods:** People aged more than 60 years of both sexes and willing to participate were included in this community based cross-sectional study. Barthel ADL index was used for assessment of activities of daily living disability, Snellen's distance vision chart for visual acuity assessment and whisper test was used for hearing assessment. The participants were categorized as functionally disabled if either ADL disability or better eye presenting vision <6/60 or bilateral hearing impairment or a combination of either these were present. **Results:** The prevalence of functional disability was found to be 23.1% in the study population and was more unmarried/widow/widower group, among illiterates, lower socio-economic class and financially dependent group. **Conclusion**: Research and studies on elderly in India especially in field of functional disability are less and community dwelling elderly has been neglected at large. Hence it would be useful to estimate the burden of functional disabilities among elderly so that adequate and timely preventive and rehabilitative measures can be taken.

Keywords: Elderly, Functional disability, Activities of daily living

Introduction

Elderly or old age consists of ages nearing or surpassing the average life span of human beings. In India persons of age 60 years or above are considered as senior citizen or elderly [1] Both the share and size of elderly population is increasing over time. From 5.6% in 1961, the proportion has increased to 8.6% in 2011.[2] According to population census 2011, there are nearly 104 million elderly persons (aged 60 years or above) in India.

Aging, an integral part of living, typically is accompanied by gradual but progressive physiological changes and an increased prevalence of acute and chronic illness. Although neither a disease nor a disability per se, aging nonetheless is associated with a high incidence of physical impairment and functional disability.[3] This is further compounded by impairment of special sensory functions like vision and hearing and difficulties in performing their routine daily activities. Since the consequences of disability can seriously affect the economic, social and psychological aspect of life of older people with disabilities and also their families and communities as well, it is found to be a major health concern among older people. The present study was carried out to estimate the magnitude of functional disability and its association with various socio-demographic variables among the elderly persons in Palam village of Delhi.

Material and Methods

A Community based cross- sectional study was carried out in Palam village in West Delhi from January to December 2016 which is one of the field practice areas of Community Medicine Department, Lady Hardinge Medical College, New Delhi. Majority of the families of the area belong to lower middle socio-economic status. Both public and private medical facilities are available in the area. The government health service in the area is being catered by

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primary health centre, Palam which is under the central government of India. While a number of private practioners and private hospitals are there but Deen Dayal Upadhyay Hospital is the nearest tertiary care government hospital to area situated in Hari Nagar.

A Semi-structured interview schedule was administered to all the study subjects for obtaining socio-demographic details. Sample size was calculated using prevalence of 19% (at least one ADL restriction), absolute error of 5%, (confidence interval = 95%, power = 80%).[4] Taking design effect of 1.25 and response rate of 90%, the effective total sample size was taken to be 350. 1st house was selected randomly and subsequent houses were selected by systematic random sampling (every 2nd house was taken to choose the study subjects). To obtain the total sample size of 350 elderly, a total of 418 households were screened.

People aged more than 60 years of both sexes in the study area and willing to participate were included in the study, while people more than 60 yrs of age who were known case of psychiatric disorder and who refused to give informed consent were excluded from the study.

Barthel ADL[5,6] index was used for assessment of activities of daily living disability in the study population (ADL Disability). The ten variables addressed in the Barthel scale are fecal incontinence, urinary incontinence, grooming, toilet use, feeding, transfers, walking, and dressing, climbing stairs and bathing. Each performance item is rated on this scale with a given number of points assigned to each level or ranking yielded a score of 0–20. ADL disability is defined in the study subject if the total score in Barthel ADL index is < 20.[5, 6]

Visual acuity was assessed by using Snellen's distance vision chart and visual disability defined as visual acuity of <6/60 in the better eye.[7]

For hearing assessment, all the participants were first administered the whisper test. Those who fail the whisper test were examined with Rinne's test and Weber's test for hearing status, using a 512 Hz tuning fork. Hearing impairment was defined as conductive and/or sensori-neural deafness of both ears as assessed by Whisper test, Weber's test and Rinne's test.[8]

The participants were categorized as functionally disabled if either ADL disability or better eye presenting vision <6/60 or bilateral hearing impairment or a combination of either these were present.[9,10]

Weight, Height, Pulse rate, Blood Pressure, Pallor, Icterus, Cyanosis, Clubbing, Lymphadenopathy, Pedal Edema were evaluated for every study subjects followed by systemic examinations. Approval for the study was taken from the ethical committee of Lady Hardinge Medical College and written informed consent was taken from all the study subjects.

Data was analysed using SPSS version 19. Observations were described in terms of mean, range and standard deviation for Continuous data and in terms of percentage / proportions for Categorical data. Chi square test was used to detect statistical significance for qualitative variables and p value < 0.05 was considered statistically significant.

Result

Of the total 350 study population, 166 (47.4%) were males and 184 (52.6%) were females. Mean age of the study subjects was 67.40 ± 6.63 years and Range was 60-93 years. On the basis of educational status it was observed that majority of the study subjects (47.1%) were illiterate. There were 80.7% of currently married males compared to 57.6% of currently married females and 42.4% of females were widows compared to 18.7% males who were widowers. Majority of the study subjects (86.6%) were living in joint families. Among males 74.7% were unemployed (mostly retired) and among females 85.9% were unemployed (mostly housewives). One hundred and twenty nine (36.9%) of study subjects were financially dependent on others.

The prevalence of functional disability was found to be 23.1% in the study population which was 21.1% in males as compared to 25.0% in females. An increasing trend in prevalence of functional disability was seen with increase in age in both male and female gender and it was observed to be higher (35.5%) among unmarried/widow/widower group as compared to currently married (17.5%) and the association was found to be statistically significant. (Table 1)

The prevalence of ADL disability was found to be 20.3% in the study population, while prevalence of visual disability and hearing disability was found to be 6.3% and 1.4% respectively. It was observed that 4.0% of study subjects were having both ADL and visual disability and 0.2% were having all three (ADL+ visual +hearing) disabilities. The association of various socio-demographic variables with functional disability has been shown in table 1.

Discussion

The global demographic trend tells us that with the passage of time, the countries have experienced ageing of population which has profound social, economic and political implications for a country. This study was carried out to find the magnitude of functional disability in elderly population in an area of West Delhi and to find its association with various socio- demographic variables.

Various definitions have been used to describe functional disability in published literatures.[9,10] In the present study the participants were categorised as functionally disabled if ADL disability is present or better eye presenting vision is <6/60 or bilateral hearing impairment is present or

Table 1: Association of functional disability with various socio-demographic variables

Socio-demographic variables	Functional disability present (%)	p value	Statistical significance
Age group			
60-69	9.5	<0.05	Significant
70-79	38.6		
80 & above	80.6		
Sex			
Male	21.1	-	
Female	25.0	-	
Marital status			
Married	17.5	<0.05	Significant
Unmarried/ Widow/ widower	35.5		
Type of family			
Joint	25.1	> 0.05	Non-Significant
Nuclear	8.1		
Living alone	20		
Educational status			
Illiterate	33.3	<0.05	Significant
Primary school & above	14.1		
Socio-economic status			
Upper and Upper middle class	7.1	<0.05	Significant
Lower middle class	27.8		
Upper lower class	20.7		
Lower class	66.7		
Financial dependence			
Independent	13.1	<0.05	Significant
Partially dependent	35.7		
Fully dependent	25.6		

a combination of either. Only one study on functional disability in India has been done by Gupta P et al (2011-12) using the same definition criteria as used in present study.[10] Since studies on functional disability among elderly persons using the same definition criteria are less, therefore comparison of findings of our study with other studies elsewhere is limited by definition criteria, difference in the ways disability was quoted and sample characteristics.

In the present study the prevalence of functional disability was found to be 23.1% in the study population. An increasing trend in prevalence was seen with increase in age and was found to be statistically significant. Similar pattern was seen in cross-sectional studies conducted by Deepthi R et al (2011) among rural elderly population in two villages of Bangalore district of Karnataka, and in international studies done by Yoshida et al (2005-06) in Japan and Abdulraheem et al (2010) in Nigeria.[11,12,13] Gupta P et al (2011-12) reported higher prevalence of functional disability (38.4%) than our study using the same definition criteria for functional disability, however gender wise pattern was similar to our study, i.e. more in females (38.8%) than males (35.9%). Since the study was conducted in rural area of Haryana, so lack of available health care facilities could be the reason behind higher prevalence of female disabilities.[7]

ADL disability has been used in a number of studies to quote functional disability based on Barthel ADL scale. Using the 10 items Barthel scale, prevalence of ADL disability in the present study was found to be 20.3% which was 22% in study done by Venkatarao et al (1998-99) and 16% in study done by Chakrabarty et al.[14,15] Day et al reported only 6.9% ADL disability as it was a hospital based study and included the elderly who attended the geriatric clinic only.[16]

The prevalence of ADL disability in the present study was similar to some studies done in countries like Japan (20%), Malaysia (19.8%).[17,18] However lesser prevalence was noticed in studies carried out in USA (15%) done by Chaudhry SI et al (1992), which can be due to better health care facilities and health seeking behaviour of the study population in that geographical portion.[19] The prevalence was reported to be higher in studies done in other developing countries like Nigeria (28%) and Brazil (40%).[13,20]

Vision loss has a profound impact on daily functioning and is regarded as an important contributor to disability. In the present study, prevalence of visual disability as quoted by visual acquity <6/60 in the better eye was observed to be 6.3% and an increasing trend was observed with the increase in age. Presenting vision <6/60 in the better eye was observed in 8.5% in a nationwide survey done by Murthy et al (1999-2001) among persons aged 50 years and above.[21] In a study done by Deepthi R et al (2011), 12.6% of the study subjects were reported to be blind and significant association was seen with increasing age.[11] Sanbaz and Tel (2006) reported in their study that a large portion of the elderly had problems in performing their

activities due to loss of sight and hearing. [22] Most studies have shown people with higher level of visual impairment are more probable to report disability in activities of daily living.[23, 24, 25]

Prevalence of hearing impairment as assessed by whisper voice test and Rinne's test and Weber's test was observed to be 1.4% in the present study. There is difference in the prevalence of hearing impairment in present study and other studies because of difference in the study instruments used to measure hearing impairment. In a study done by Lasisi et al (2010) prevalence of self-reported hearing impairment was observed to be 6.1%.[26] Prevalence of hearing impairment was 33.5% in persons aged 60 years and a study conducted by Khandekar et al using screening audiometer.[27] Deepthi R et al (2011) reported 24.6% of the elderly had disabling hearing impairment using pure tone audiometry.[11]

In addition to the commonly used ADL disability, visual disability and hearing impairment were also included to quote functional disability in our study as they also have the potential to restrict the functional ability of persons. Study subjects with more than one disability i.e. combination of disabilities were also found in the study population similar to the study done by Gupta P et al (2011-2012).[10] So if appropriate curative or rehabilitative measures are taken in due course of time, it will reduce the suffering faced by them due to the above quoted disabilities.

Conclusion

The increasing number of older persons put a strain on health care and social care systems in the country as growing age leads to various disabilities and thereby increasing their health care needs also. To face the challenges of ageing population, the country needs to be well prepared. Appropriate social and economic policies are need to be made to mitigate its ill effects which should also address their health care needs.

Recommendations

Based on the conclusions derived from the study, the following recommendations are put forth:

- Comprehensive geriatric care should be incorporated into all levels of health care and particularly in primary health care.
- The high prevalence of functional disability among the study population requires suitable interventions at the community level itself.
- Social security schemes and medical benefits for the elderly should be strengthened up and made available to larger sections of the elderly
- Elderly living without families or under difficult conditions should be identified in the community and proper care should be provided to them with the help of health workers.
- Elderly needing Supportive items like Walking Sticks / Calipers, Walker (ordinary), Spectacles, Hearing Aids etc should be identified and should be provided with them starting from the sub centre level only.

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ORIGINAL ARTICLE

Impact of Community Based Training on Medical Undergraduates Skills Upgradation Regarding Infant and Young Child Feeding Practices: A Mixed Method Study

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Abstract

Background: Despite various reforms brought in health care service delivery there is always a gap between community and health care providers. Hence there is a need to explore the successful strategies to reorient the medical students towards public health relevant community needs. **Objective:** This study aimed to assess the feasibility and impact of community based field training imparted among medical undergraduates to identify problems related to infant and young child feeding practices and design appropriate interventions. **Material and Methods:** This study is a mixed method study where improvement of knowledge were assessed quantitatively through quasi experimental pre-post study design. Difference in cumulative score obtained after training was compared using student's t test. Perception of students and mentor's views on this approach in terms of benefits and challenges were explored during in-depth interviews. Transcripts of qualitative interviews were analysed using manual content analysis. **Results:** Total of 781 infant and young children from 30 villages were surveyed by 36 medical undergraduates. There was significant improvement in knowledge on feeding practices from the baseline [baseline mean (SD) score: 3.3 (1.5); post training mean (SD) score: 6.5 (1.1), p<0.001]. Mentors of the opinion that this community based approach had facilitated the students to acquire skills on management, communication, team spirit and professional attitude. Students had opportunity to assess spectrum of illness and the co-existing social conditions in their natural setting. **Conclusion:** Students as well as other stakeholders were more positive and overwhelmingly supporting this approach. This approach is feasible with better planning, institute cooperation and commitment.

Key words: Children, Feeding practices, Community based education, Field based training, Medical education undergraduates

Introduction

More than 60% of the Indian population live in rural area.[1] Despite the recent reforms brought under National Health Mission about 12% of sanctioned posts are vacant at primary health care level.[2] There has always been a gap between health care providers and the community. To reduce this gap Alma Atta declaration in 1978 emphasized on the need for community participation Reorientation of Medical Education suggested by World Health Organization is one such move to reduce this gap. [3,4]

The Medical Council of India also says the primary objective of MBBS course is to make a culturally competent physician for the community.[5] Though hospital-based teaching has its own merits unless the students are exposed to field based/ community training, their perceptions of health care needs of the community maybe inaccurate. Community based education refers to teaching future health care providers either in the community or in the primary care facility settings.[6] There are several practical issues involved in teaching rural communities to the medical students. There is a great demand from the policy makers and regulating authorities of medical education (MCI) for the field based training in India.[5]

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Of the total population, under-5 children constitute approximately 10-13% and they contribute about 20% of the out patients visiting the primary care settings.[1] Among the under-5 children, malnutrition contributes to more than 50% of deaths either directly or indirectly.[7] Faulty feeding practices followed among the infant and young children are the most predominant factors which cause malnutrition among children.[8] As per the recent surveys, 21% children are wasted, 38.7% are stunted and 35.7% are underweight (NFHS 4). Undernutrition is higher among children in rural areas as compared to urban areas. Not only the nutritional status, even the optimal feeding practices are found to be poor among rural children. Moreover, there are lots of food taboos, myths and misconceptions in the field of infant and young child feeding practices.[9,10] Despite of the recent hike in literacy and institutional delivery rates, health literacy among care givers were found to be poor.[2,11,8] Hence, there is a strong potential need to sensitize the future physicians on infant and young child feeding practices and orient them towards community needs on this issue through community based education. According to Miller's pyramid improvement in knowledge or cognition is the first sign of effective learning.[12]

In this context, this study was planned to know whether the community based education provided through community based research project increases the knowledge and application on infant and young child feeding practices among medical undergraduates from South India.

Material and Methods

Study Design and study duration: This is a quasi-experimental study where the study has assessed the impact of community based training on infant and young child feeding practices. In India, MBBS course of four and a half years duration spread over nine semesters. This community based training was held during the sixth semester for the duration of one month from January 2017 in Pondicherry Institute of Medical Sciences, Puducherry.

Study setting: This study was conducted in villages located around rural health training center affiliated to tertiary care academic institute. This center is functioning with the team of multi-disciplinary work force namely medical officers, staff nurses, Auxiliary Nurse Midwives, medical social workers, resident doctors and lab technicians. Once in a month the outreach team makes regular visit to all households in the field practice area. Accordingly, demography and morbidity profiles are updated periodically in the database of Community Health Information Management System.

Study population: A total of 150 students who were in sixth semester were divided into four groups. Community based medical education was implemented in the form of cross sectional community based public health oriented research projects. The group who were involved in assessing prevailing infant and young child practices formed the study population. Infant and young children included children born between 1st January 2015 to 31st December 2016 as per the list obtained from the Community Health Information Management System (CHIMS). Primary care givers of the eligible children were approached for further enquiry. Details of the training given are as per the following:-

I. Pretest

Before inception of this community based research project students were asked to fulfill the questionnaire anonymously which formed a base for the students' knowledge on infant and young child feeding practices. The pretest had 10 questions related to appropriate feeding practices to be followed in various age group of children, nutritional assessment among under-5 children and management for under nutrition. Questions were framed in the form of multiple choice questions covering descriptive to case based scenarios. For each correct answer students were awarded one mark and wrong answers and unattended questions were awarded zero. At the end, cumulative score was calculated for each student.

II. Orientation to research

Following the pre-test assessment, students were oriented to research methodology through workshop which included sessions related to rationale for conducting research, framing research protocol, tool development for data collection, instrument standardization, validation of questionnaire, data management and report writing.

III. Briefing on infant and young child feeding practices

In the first week of CBE students were taught about optimal breast feeding practices, appropriate complementary foods suitable for different age group of children, dietary diversity, anthropometry, assessment and grading for nutritional status of the young infants using National Health Mission guidelines through lecture, case based learning and demonstrations.

IV. Situational Analysis

Students were divided into 17 teams comprising of 2 students in each team. Line list of children born between 1st January 2015 to 31st December 2016 were obtained from the Community Health Information Management System (CHIMS) and anganwadi centres whichever is available and up to date. Using the pretested proforma students made house to house visit in the selected villages in

multiple teams. If eligible infant and young children were there in the selected house the care givers were interviewed regarding socio demographic status and feeding practices followed for the particular child. Anthropometric measures were recorded as per the training (Supplement 1: proforma; supplement 2: pre and post test questionnaire). After approval from the concerned faculty for data accuracy and completeness, Data entry was done team wise on day-to-day basis in EpiData entry software (EpiData version 3.1) using valid checks.

V. Project Intervention – Information, Education and Communication (IEC) campaign

At the end of the second week students compiled all valid records and analysed the key prevailing infant and young child feeding practices. Before the campaign, community mobilization especially among mothers of under-5 children was done through medical social workers. Based on the analysed results, they had planned for an IEC campaign on feeding practices. In the campaign various health education messages were displayed in an attractive way through posters, charts and food models. To increase the applicability among others some of the energy dense recipes which will be appropriate for young children were demonstrated in live counters. To involve the community in the IEC campaign and to share the best recipes available within them the cooking competition was arranged in the premises of health centre. There was also role play held by the students to emphasize the need for clarifying myths and misconceptions on child feeding practices.

VI. Post test

On the last day of the CBE, students were provided with the same questionnaire as like pre-test. Similar to pretest, in the post test cumulative score also was calculated for each individual student.

VII. Feedback

At the end of the project feedbacks were obtained for the open ended questions such as what do they perceive regarding positive aspect and challenges of community based education and key informant interview with the concerned medical social workers, residents and faculty supervisor.

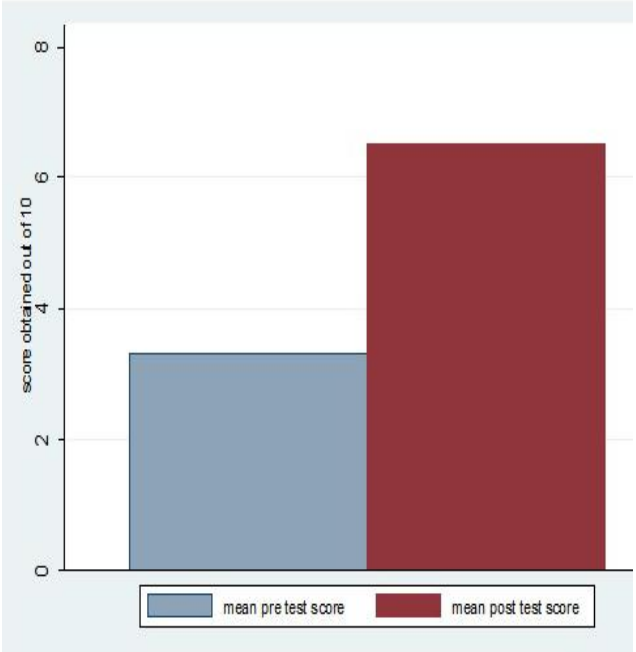
Data Analysis:

Mean score obtained before the community based project was compared using students t' test. Statistical significance was decided at <0.05 level. All the key informants (two medical social workers, two supervisors, Postgraduate and interns and one faculty supervisor) were interviewed by the trained qualitative researcher using topic guide. With their consent field notes were taken. Transcripts were made by one of the authors on the same day. Transcripts were read back to the key informants to increase the participant validation. Transcripts were analyzed through manual content analysis through iterative process independently by two authors.

Results

Totally 36 students (13 male, 23 female) were there under the community based research project on "prevailing IYCF practices". Of the 36, 32 students participated in the pretest and 29 students participated in the post test survey. Cumulative score obtained before the project was 3.3 ± 1.5. After the community based project, the students score was significantly improved to mean (SD): 6.5 (1.1) from the baseline ($p<0.001$) [fig 1]. Of the ten items included in the questionnaire seven items had significant improvement ($p<0.01$).

Key informant interviews and students written feedback were analysed using manual content analysis. The whole transcript was coded as six categories under the theme of effect of community based medical education. Similarly under the theme of challenges there were three categories made such as motivation, logistics, and manpower. The themes, categories and the important quotes which supports that category is given in table 2.



Graph 1: Comparison of mean pretest and post test scores

Discussion

This pedagogical exercise carried out among sixth

Table 1: Item wise comparison of improvement on knowledge related to infant and young child feeding practices

Item	Item description	Pretest score	%	Post test score	%	p value
1	Infant and young children	15	47	21	72	0.01
2	Exclusive breast feeding	3	9	27	93	0.0001
3	Time to start complementary feeding	22	69	29	100	0.001
4	Dietary diversity	7	22	26	90	0.0001
5	Choice of complementary food	19	59	26	90	0.007
6	Amylase rich food/energy dense foods	9	28	26	90	0.0001
7	Continued breast feeding	13	41	15	52	0.4
8	Vit A supplementation	4	13	13	45	0.006
9	Malnutrition assessment – various methods	1	3	1	3	0.9
10	Grading of under nutrition	14	44	6	21	0.06

semester students on community based medical education received overwhelming response from students as well as the other stakeholders such as medical social workers and faculty supervisors. Not only the team has perceived this learning as satisfied one it has resulted in knowledge gained in the selected topic. Knowledge of the students had significantly improved. Scores had improved twice compared to the baseline. Above all, students could utilize this knowledge in understanding the situation and plan for appropriate intervention and implementing the same. For the professional courses like MBBS the best learning outcome would be not only to acquire knowledge but to progress towards application as said in the educational theory of Bloom's hierarchy.[13]

After the Bhore committee recommendation various community based education models were tried such as community orientation programme, community diagnosis approach, Reorientation of medical education (ROME), family health advisory programme, in stay rural postings and adopting villages.[14] Some of the institutes of national importance had shown the successful model on these approaches. Of the several approaches WHO had strongly emphasized the "Reorientation Of Medical Education" at global level.[4] Gradually due to the lack of funding support and change in MCI norms and institutional disinterest at present not many institutes are following this pattern.

In this study students and faculty were of the opinion that this ROME has helped them to perceive various social determinants of health, build a team spirit and professional attitude. Similar to this Wee L En et al had reported home-based learning to be the better method to teach communication skills, team work, perception of social issues and applied knowledge.[15] Mudarikwa et al had said community based research projects are the best platform for mutual learning and the medical students to get real time experience. Gibbs et al from One of the Gulf University had compared the perception of students who learnt in the different environment namely urban tertiary care teaching hospitals, remote rural secondary referral hospital and rural community based programme. He concluded that rural community based programme was involved with more effective patient contact in contrary to other two settings where they spent majority of the timings in didactic lectures and tutorials. In the current study also less than one fifth of the time was spent in class rooms and rest of the time was spent in direct contact in the community or in the IEC campaign.[16]

Similarly, in India Dongre et al from Wardha had reported that the ROME programme was well regarded by all the students in all domains[17]. Krishnan A et al from All India Institute of Medical Sciences, New Delhi also had opined that the students were positive in community oriented approach and they prefer largely towards activity based learning.[18]

This study has several strengths. Firstly, this study systematically assessed the learning outcome of community based medical education in the form of "Reorientation of Medical Education" which was stopped by majority of the institutes in India. Secondly, the study used mixed method approach where the improvement in knowledge was assessed quantitatively and perceptions of the student and various stake holders were recorded using qualitative designs. Thirdly, we had insisted anonymity in the pre-post test questionnaire to reflect the real knowledge of the student.

In this study, number of students who participated in the post test survey does not match with pre test survey. To avoid the halo effect of the projects perception, we had collected the post test questionnaire two weeks after the project. That resulted in loss of these students. This study has following implications for the field of medical education. This study demonstrates the feasibility of carrying out this exercise and it is worth investing in the process of training community care physicians. Nevertheless, there should be strong commitment and planning before the execution of this task.

Table 2: Theme, categories and the important quotes which supports that category

Theme	Category	Quotes
Effect of community based medical education	Holistic assessment of the health problem	"They are observing the children in the natural setting. They are observing the peoples social organization and environments. They also get a glimpse of psycho social relationships among members of family and their neighbours." "They get the opportunity to learn about community structure and its influence on their respective choices in health knowledge or healthy practice." "In this approach they just don't see the disease as a separate entity they look for the overall determinants also." "Over this one month period they get clarity and become well versed in that assigned topic." "They are able to see the whole spectrum of cases from well-nourished children to severely malnourished one"
	Team spirit	"They develop a team spirit and willing to take leadership role" "Here when they are put in a situation for specific task they develop a team spirit. When they study in other context they read for themselves and the outcome becomes individual oriented. But in this the outcome is a result of group work and co-ordination of various divisions."
	Professionalism attitude	"Since we had divided them into various divisions such as: logistics, monitoring, IEC campaign, data quality check, data management, report writing, they develop a accountability and ownership. This approach makes them to perceive their roles and responsibilities as a part of health team. As they co-ordinate with each other they develop an orientation towards professionalism." "This helped them to learn regarding the role of grass root workers in primary health care. They also could perceive how the co-ordination with other allied workers in the health team and grass root workers can make their work more efficient."
	Communication skills	"Before they become a clinician in future they learn communication skills which can help them a lot in their day-to-day clinical practice." "It largely helped them to build their communication skills and to inculcate and enhance professional behaviour within them."
	Planning	"They perceive it with the spirit of ownership that leads them to learn meticulous planning a priori, logistics management and successfully implementing the assigned tasks and targets on day-to-day basis."
	Research skills	They will learn lot about research starting from retrieving the existing literature, handling the softwares for research
Challenges	Travel	"There is lot of time spent in travel. Travelling back and forth to the main institute takes majority of the time." "Within a short span of time too many things to learn."
	motivation level	"It is taking some time to understand to get the orientation towards community initially they are hesitant about how to do the whole activity in one month period but eventually they get oriented. Some of the medical students will be little frustrated for initial few days. Since this approach is new for them they need continuous motivation to get along."

Conclusion

Community based education imparted in the form of community based research project under Reorientation of Medical Education has improved the student's knowledge significantly and it facilitated to apply that knowledge in the field. Students as well as other stakeholders were more positive and overwhelmingly supporting this approach. This approach is feasible with better planning, institute cooperation and commitment.

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ORIGINAL ARTICLE

Universal Health Coverage in Relation to Antenatal Care Services and its Correlates

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Abstract

Introduction: Universal health coverage (UHC) means all people receiving the health services they need, of sufficient quality to be effective while at the same time ensuring that the use of these services does not expose the user to financial hardship. So, we did this study to assess the extent of UHC in relation to antenatal care services in Palam area of Delhi. **Objectives:** 1) To study the extent of coverage of antenatal services in Palam area of Delhi. 2) To assess the correlates of coverage of antenatal services among mothers. **Material and methods:** study type- a community based descriptive study was conducted between September 2015 to March 2017, among 250 mothers who delivered during the year 2015. A pretested, self-designed, semi-structured interview schedule and health records was used to collect information. Data was analysed using software – statistical package for social sciences (SPSS) version 20. **Results:** Out of 250 study participants, complete coverage of antenatal care services was seen in only 28.8% women. Literacy and presence of complication in previous pregnancy found to have statistically significant correlation with the extent of coverage of antenatal services. **Conclusion:** Women need to be educated about their health needs and services available to them, in order to increase the demand of maternal health services and improve utilization of available services.

Keywords: Universal health coverage**,** antenatal care services, correlates.

Introduction

Universal health coverage (UHC) is about ensuring all people get the quality health services they need, without experiencing financial hardship.[1] Quality Maternal health services comprise of quality antenatal, natal and postnatal services.

Quality Antenatal services comprise of:

- Ideal number of ANC visits (Ideal no. of visits is 11 or more and minimum recommended is 4 visits)
- Quality services provided during those visits.

Maternal health refers to the health of women during pregnancy, childbirth and the post-partum period. Majority of the complications related to maternal health can be averted by preventive care (such as antenatal check-ups, birth preparedness), skilled care at birth, early detection of risk, appropriate and timely management of obstetric complications and postnatal care. The challenge lies in ensuring that this package is delivered at a sufficient scale and with sufficient quality to have a significant impact.[2] Studies from India have perpetually been manifesting the concern of inequities in utilization of maternal health care services.[3,4]

The number of women dying due to complications during pregnancy and child birth has decreased by 43%.[5] The progress has been too slow to achieve the Sustainable Development Goal (SDG) of ending preventable maternal mortality.[6]

The key obstacle reported is pregnant women's lack of access to quality skilled care services.[2]

Universal health coverage has been emphasizing on providing not only the minimum health services but the adequate quality health services. And we need to move beyond the minimum maternal health services in order to achieve the SDGs targets of ending the preventable maternal and infant deaths. Still, most of the studies till now

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have been focussing on the coverage of only the minimum recommended maternal health services (i.e. 4 antenatal visits or not). So, we planned this in Palam area to assess the extent and quality of antenatal health services.

Material and Methods

The present study is community-based cross- sectional study conducted between September 2015 to March 2017 among women in Palam area of Delhi which is a field practice area of the Department of Community Medicine Lady Hardinge Medical College, New Delhi. The area is well connected by public transport system. Majority of the families of the area belonged to upper lower or lower middle socio-economic class. Both public and private health care facilities cater to the health care needs of the residents. The government health services in the area are provided by Primary Health Centre, Palam under Central Health Service. The nearest referral centres of the area are Dada Dev Matri Evam Shishu Chikitsalaya, Dabri and Deen Dayal Upadhyay Hospital, Hari Nagar being the Community Health Centre and Tertiary Care Hospital of the area respectively. Nearby many private health facilities are also situated.

Assuming the prevalence of complete MCH coverage to be 45% (based on previous study findings), considering an allowable error of 15% and level of significance as 95%, and non -response rate of 15%, we had enrolled 250 women for the study. [7]

A list of all the deliveries that occurred in the year 2015, was made by combining the records obtained from multipurpose health workers of PHC Palam and Anganwadi workers in that area. Out of this list, 250 mothers were selected by simple random sampling using lottery method without replacement. Only those women who were residing in Palam area for >2 years were enrolled in the study.

The selected mother was interviewed by conducting house to house visit and information was recorded based on a pretested, self-designed, semi-structured interview schedule. Mothers were also enquired for the health facility records if available and the information gathered was cross checked and supported by these records.

Table 1: Distribution by coverage of quality ANC and PNC visits (n= 250)

Health service	Complete coverage	Partial coverage	Less than minimum coverage
Antenatal visits	72 (28.8)	154 (61.6)	24 (9.6)

Coverage of antenatal services:

Extent of ANC coverage was assessed as per the guidelines of Govt. of India, under the RMNCH+A Programme.

COMPLETE COVERAGE OF ANTENATAL SERVICES: A woman is considered to have complete coverage of antenatal services if she was registered within 12 weeks of gestation and received the recommended ideal number of ANC visits (11 or more along with first visit of registration) and quality antenatal service during those visits which includes-check-up, full dose of tetanus vaccination, adequate amount of iron folic acid tablets and all the routine investigations done during antenatal visits.

PARTIAL COVERAGE BUT ADEQUATE: A woman is said to have partial coverage but adequate if she received equal to or more than four (04) ante-natal visits and got all the essential components of antenatal care.

INADEQUATE COVERAGE: A woman is said to have inadequate coverage if she received less than four antenatal visits or did not receive all the essential components of antenatal care in any of those visits as recommended.

Also, the information regarding the reasons for not availing or inadequate services was obtained. Informed written consent was obtained from all the participants.

Data gathered was entered into a spreadsheet database created using Statistical Package for Social Sciences (SPSS version 20). Observations have been described in terms of mean, range and standard deviation for Continuous data and in terms of percentage / proportions for Categorical data. Regression analysis was done to identify the correlates of coverage of antenatal quality services.

Results

Out of 250 women, only 28.8% had complete coverage of ANC services during their last pregnancy, 9.6% had inadequate coverage (6 women did not receive any antenatal care) and more than half i.e. 61.6% had partial but adequate coverage. Weight and Blood Pressure was recorded during each ANC visit in majority of women i.e. around 90%. Almost all i.e. 97.6%, got the full dose of Tetanus Toxoid vaccination.

Only half of the study subjects i.e. 55.2% took IFA adequately. Among anaemic women, only (40.8%) took Iron folic acid adequately whereas among non- anaemic, 73.1% women took IFA tablets adequately (Table 2). Nearly 90% of women got tested for Blood group, HIV, VDRL and HbsAg whereas as per recommendation investigations like Blood sugar, Urine routine microscopy, USG and Haemoglobin testing was done twice in only 54%, 50.4%, 64% and 74% respectively. (Table 3)

Table 2: Distribution by coverage of quality ANC services during ANC visits (n=250)

Services availed	Recommended	As recommended	Less than recommended	Not availed/ done
Weight measurement	Each visit	232(92.8%)	12 (4.8%)	6(2.4%)
BP measurement	Each visit	226 (90.4%)	17 (6.8%)	7(2.8%)
IFA intake	For anaemic 1tab BD, for non-anaemic 1tab OD (x100 days or more)	138 (55.2%)	106 (42.4%)	6 (2.4%)
TT immunization	2 doses or 1 booster if previous pregnancy in last 3 yrs.	244 (97.6%)	Nil	6 (2.4%)

Table 3: Distribution by investigations done among study subjects during ANC visits (n=250)

Investigations	Recommendation	According to Recommendation	Less than recommended	Not done
Blood group	Once	244 (97.6)	-	6 (2.4)
Random blood sugar	Two times (at least)	135 (54.0)	109 (43.6)	6 (2.4)
Haemoglobin	Two times (at least)	185 (74.0)	59 (23.6)	6 (2.4)
Urine routine microscopy	Two times (at least)	126 (50.4)	118 (47.2)	6 (2.4)
HIV	Once	240 (96.0)	-	10 (4.0)
VDRL	Once	233 (93.2)	-	17 (6.8)
HBSAG	Once	221 (88.4)	-	29 (11.6)
USG	Two times (at least)	160 (64.0)	77(30.8)	13 (5.2)

Table 4: Reasons/ Barriers for partial or non-coverage of ANC services (n=178)

Reason (n=178)	Frequency*	Percent
Lack of knowledge	103	57.9
Long waiting lines	26	14.6
No one to accompany	14	7.9
Rude behaviour of staff	12	6.7
Time is not suitable	11	6.2
Cost of the services	7	3.9
Religious and social beliefs	5	2.8

*Multiple responses

Table 5-Determinants of utilization of antenatal health services among study subjects (n= 250)

Factor studied	Coefficient of correlation	p value	Coefficient of regression	p value
Literacy	0.184	0.011	0.158	0.035
Ses	-0.022	0.393	0.015	0.845
Parity	0.061	0.224	0.033	0.693
Complication in last pregnancy	-0.135	0.047	-0.202	0.116

Findings of our study showed that lack of knowledge was the main reason in majority of the women (52.8%) who did not avail the complete antenatal care. This was followed by long waiting lines in the government health facilities as the reason for 14.6% women and 14 (5.6%) women said that they had no one to accompany for their antenatal visit. Whereas rude behaviour of the health personnel, lack of time, ignorance, financial reasons and religious beliefs were also reasons for some women for inadequate ANC care. (Table 4).

Among the various factors studied, literacy and presence of complication in previous pregnancy were found to be statistically significant correlates for utilisation of antenatal care services (Table 5).

Discussion

In the present study, it was observed that majority of women i.e. 90.4% either partial or complete received antenatal care. Our findings were comparable with similar findings of around 90% coverage of any form of antenatal care in India and Brazil.[8,9-11] In contrast, less utilization of antenatal services also been reported in rural north India and Bangladesh with 40.3% and 48% utilization rate respectively.[12,13] High level of coverage was seen in our study population located in the Capital, as it has access to adequate number of facilities providing good antenatal services.

Majority of the studies assessed only the minimum number

of antenatal visits and women receiving the minimum services ranged between 51.2% - 81.5%.[9,10,14,15] Whereas studies had also been reported from different areas of India and Bangladesh showing very less ANC utilization i.e. only 41.4%, 10.5% and 33.7% women receiving more than 3 antenatal visits.[17] The main reason revealed for poor antenatal utilization was unsatisfactory behaviour of health staff as well as lack of trained health care professionals.

Some other researchers have taken full antenatal care as at least three or four antenatal visits, tetanus toxoid and iron folic acid tablets or syrup taken for 100 or more days and found that in Nepal and India, the coverage was 21%, 24.7% and 29.1%.[15,16,19]

Present study assessing the complete coverage showed that only 29% women received complete coverage, 61.6% partial but adequate and 9.6% inadequate antenatal services.

Different researchers reported different barriers in utilization of ANC services. Unsatisfactory behaviour of health staff and lack of trained health care professionals was reported in India, Bangladesh and Nepal.[16-19] Other barriers reported were lack of perceived need, long waiting time, lack of time, cost of service and also distance to health facility reported.[19-21] These barriers were also reported in our study.

Conclusion

As the complete coverage is seen in only 29% of mothers, rather than focussing only on minimum antenatal services, the effort should be made to improve the coverage of complete ANC services to achieve the SDGs goal of UHC. Different barriers should be addressed properly to achieve the target of universal coverage of maternal health services. Regular reorientation and training programs should be organized for the health workers to have the trained health staff. Women need to be educated about their health needs and services available to them, in order to increase the demand of maternal health services and improve utilization of available services. Up-gradation of existing PHCs and CHCs is need to be done to address the issue of long waiting lines and huge rush at public health care facilities. So, we need to provide good quality services at public health facilities Also provision of health insurance should be made to address the issue of cost as a barrier.

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Public Awareness Lectures at Hospital Complex of AIIMS Bhubaneswar: Bridging the Gap Between People and Healthcare Professionals

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Abstract:

Health communication forms an important link in a doctor patient relationship. Public health awareness lectures are organised across the world to disseminate key messages related to health and to improve the doctor patient interaction. With a plethora of information in this age of social media, which are many a time incomplete and erroneous, it is all the more important that people get the right information based on scientific evidence. In this article we intend to describe our experience of public awareness lectures held at AIIMS Bhubaneswar over the last one year.

Keywords: Awareness, lectures, behaviour, health literacy

Introduction

"Awareness is the first step of healing"- **Dean Ornish**

Awareness is an understanding of a situation or subject at the present time based on information or experiences. When it comes to health or health related issues, the general public get the information or sometimes misinformation from their friends and relatives. In present times, social media forms an important medium of dissemination of health information to the masses. Many a times, this information is found to be incomplete or erroneous and is usually without any valid evidences.

Awareness campaigns are organised communication activities designed to raise awareness, induce behaviour change and improve quality outcomes for individuals and populations.[1] Public Health awareness campaigns are different in that they are "intended to promote or protect health or prevent ill health in communities or populations".[2]

Need of Public Awareness lectures:

In spite of having a lot of queries in mind, when patients come to hospital for consultation for any disease, they fail to ask the same to the doctors. Many a times, even the doctors fail to address all the health related queries by the patients or their attendants due to time constraints and communication gaps in the Out Patient Department (OPDs). To address this problem, health department is trying to make people aware on different health issues by displaying hoardings, banners in the hospitals and distributing pamphlets, but the reach remains limited only to the literate. Public health is a multi-disciplinary approach with a wide variety of professionals constituting the team. Public health problems can rarely, if ever, be compartmentalized.[3] There are multiple causal factors for a disease state and several approaches towards the problem requiring an interdepartmental approach to tackle them.

Public Awareness lectures at AIIMS Bhubaneswar:

AIIMS Bhubaneswar is one of the rapidly growing premier medical institutions in eastern India which was built under Pradhan Mantri Swasthya Suraksha Yojna (PMSSY) in the first phase besides other five new AIIMS in different parts of the country. Daily OPD attendance is around 1500-2000 patients on a typical working day. It not only caters to the population of Odisha but also the adjoining states of West Bengal, Chattisgarh and Jharkhand.

To make people aware regarding health and health related issues and the facilities available in the hospital, AIIMS Bhubaneswar has taken an initiative of conducting Public

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awareness lectures since last one year. Different health issues are being addressed by celebrating health days and conducting public lectures on prevalent public health problem(s) or outbreaks taking into consideration the need of the hour. Specialists in various fields were roped in to discuss the prevalent health related problems from various perspectives. The queries related to disease and hospital facilities were taken up and addressed. This activity has been accepted widely by the public and with their active participation it has become an ideal platform to ask queries directly to the doctors who are delivering the public awareness lectures. It has provided an opportunity for the doctors of the college to gauge the patient's attitude, practices and needs regarding different health related issues. The undergraduate students and interns of AIIMS Bhubaneswar have been involved in this type of activities in the outreach centres with the help of faculty and residents from the Department of Community Medicine and Family Medicine during their rural and urban postings.

Details of Public Health Lectures held at AIIMS Bhubaneswar:

Year 2017-18			
Sl No.	**Topic**	**Date**	**Departments involved**
1.	Swine Flu	22 Sept 2017	Department of Pulmonary Medicine, Microbiology, Trauma and Emergency, Pediatrics, Community Medicine and Family Medicine
2.	Cancer in Women	29 Nov 2017	Department of Obstetrics and Gynaecology, Radiodiagnosis, Community Medicine and Family Medicine
3.	HIV/ AIDS	7 Dec 2017	Department of Obstetrics and Gynaecology, Radiodiagnosis, Pediatrics, Community Medicine and Family Medicine, Odisha State AIDS Control Society(OSACS)
4.	Cancer	5 Feb 2018	Department of Obstetrics and Gynaecology, Radiodiagnosis, Pediatrics Oral Pathology, Community Medicine and Family Medicine
5.	Tuber-culosis	24 March 2018	Department of Medicine, Pediatrics, Obstetrics and Gynaecology, Community Medicine and Family Medicine

Each of the public lectures were of two and a half hour duration with an attendance of more than 200 people, including patient and their attendants.

Health communication emphasizes on the importance of communicating to the audience, the message to be delivered and the means through which it is to be communicated. An understanding of the targeted audience with their expectations from the lectures is an important component of successful health communication.[4] The positive impact and challenges of public health awareness lectures have been outlined below.

Positive impact:

1. Improvement in health literacy- Health literacy refers to personal characteristics and social resources needed for people to access, understand and use information to make decisions about their health.[5] This in turn translates to improved knowledge, informed decision-making power regarding treatment and better treatment adherence.

2. Bridge between patients and health care providers- It helps to establish a bridge between people and the healthcare providers narrowing the gaps in communication between the patient and the doctor. It helps to improve doctor-patient interaction and build a sense of trust.

3. Sense of confidence- It builds a sense of confidence of the people about the hospital which helps to improve their health care seeking behaviour. They also got an idea of the facilities available at the hospital through these interactive sessions.

4. Increased awareness to health promotion behaviours- The patients are motivated to adopt health promoting behaviour better when there is a face to face interaction with the care givers.

Challenges:

1. Creation of felt need- The message regarding dissemination of the topic to be done much earlier to ensure adequate participation among the public and

creation of a felt need among them.

2. Time constraints- To make the public awareness campaigns an ongoing regular process time constraints need to be look upon and it should be undertaken without hampering day to day activities of the hospital.

3. Beneficiary with low literacy level– One of the major challenges is to convey the messages to the illiterate people who might find it difficult to grasp the content. For this purpose pictorial content with simple messages need to be stressed upon.

4. Target group audience- An effective campaign needs to properly identify needs of the target group and to select the most relevant approach to reach and influence their behaviour. For example, Breast feeding promotion needs to be disseminated among the expectant mothers and young married females who will be in a more receptive state to adopt healthy breast feeding practices.

5. Prevalent unhealthy sociocultural beliefs and traditions- Age old unhealthy sociocultural norms and traditions are difficult to change overnight. They need to be constantly touched upon for inculcating gradual behaviour changes and adoption of healthy lifestyles.

Way forward:

The success of these lectures in realising the goals with which they were embarked on requires continuity and sustainability. Behaviour change needs long term intervention and strategies. Social norms, behaviour change (acceptance of positive behaviours and discarding negative behaviours) need sufficient time before being ingrained into their way of living. The key factors include targeting, networking and evaluation of the ongoing process for sustained results over a period of time. Improved health literacy along with increased participation of the people will go a long way in enhancing quality and satisfaction regarding patient care.

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SHORT COMMUNICATION

A Study on Knowledge and Protective Practices of STIs among Patients Attending Tertiary Care Center at Bikaner, Rajasthan

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Abstract

Introduction: The increased risk of the transmission of HIV is known to be associated with the presence of STIs and despite the presence of the National STI Control Program in India the number of people with STIs remains high. More than 1 million people acquire a STI every day. The true prevalence of STIs can never be known because of inadequate reporting due to secrecy and stigma associated with them and most of them are not even notifiable. **Objectives:** (1) To study socio-demographic factors of patient's attending STI clinic (2) To assess knowledge of patients about STI/HIV. (3) To assess protective practices of patients towards STIs. **Material and Methods**: This cross sectional was conducted in STI clinic, PBM hospital, Bikaner from Dec 2014- Jan 2016 using pre-tested and pre-structured questionnaire .The study variables were analyzed using Epi-Info7 software with application of Mean, Proportion and OR, Chi-square. **Results:** Out of 97 patients 83.5% knew about STIs. 79.4% reported having knowledge about symptoms of STIs and most common symptom reported was itching over genitals and discharge (85.5%). Statistically significant difference was present between male and female patient's knowledge about premarital sex as a factor for acquisition of STIs. 79.3% were using condoms to protect from STIs. The difference was statistically significant between knowledge and practice regarding condom use (χ^2= 6.544, df=1, p=0.01). Statistically significant difference was present between male and female patients practice regarding regular visit to STI clinic. **Conclusion**: Knowledge of patients regarding protective practices is not matching with their protective behavior.

Key words- STIs; protective practices; STI clinic, National STI Control Program, Protective behavior

Introduction

Sexually transmitted infections (STIs) have long been recognized as a public health dilemma because of their high incidence and major contribution to morbidity and mortality.[1] STIs have a profound impact on sexual and reproductive health world –wide, and rank among top 5 of disease categories for which adults seek health care. More than 1 million people acquire a STI every day[1]. STIs can have serious consequences beyond the immediate impact of infection itself. Some STIs increase the risk of HIV infection 3 fold or more. Mother to child transmission of STIs can result in stillbirth, neonatal death, low birth weight and prematurity, sepsis, pneumonia, neonatal conjunctivitis, and congenital deformities. The true prevalence of STIs can never be known because of inadequate reporting due to secrecy and stigma associated with them and most of them are not even notifiable [2]. The increased risk of the transmission of HIV is known to be associated with the presence of STIs and despite the presence of the National STI Control Program in India the number of people with STIs remains high.

Objectives

(1) To study socio-demographic factors of patient's attending STI clinic (2) To assess awareness of patients about STI/HIV. (3) To assess protective practices of patients towards STIs.

Material and Methods

This study was a hospital based cross-sectional study and conducted among patients attending STI Clinic at Govt. Medical College Hospital, Bikaner. Prior permission from the college ethical committee was taken. After getting

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informed consent patients were contacted. A pre-tested and pre-structured questionnaire was administered to all the patients who were willing to participate in the study consecutively. Total 117 patients were ready to answer the questionnaire during the 2 months of study period but we analyzed only 97 patients' responses leaving those whose answers were incomplete. Male and female patients were interviewed separately and anonymously by male and female interviewer respectively. Information was then entered into Epi-Info7 software and was analyzed using Mean, SD, Proportion and Chi-square test was applied to see the associations.

Results

The mean age was 32.9±8.66 years. Out of 97 patients 46 (47.4%) were males and 51(52.6%) were females. Majority of them were Hindu by religion (78.3%). Majority of them belonged to 26-35 years of age group (34.05%) Table1 shows the socio-demographic profile of participants. Fig1 shows the knowledge of patients about STI. About 83.5 % patients have heard about STIs. 88.7% had knowledge that condom can protect from getting STIs. Table 2 shows the knowledge of factors predisposing to acquisition of STIs. The most common predisposing factor said by male patients was multiple sexual partners followed by unprotected sex. Female patients reported multiple sexual partners and premarital sex as main predisposing factors for acquisition of STIs. Statistically significant difference was present between male and female patient's knowledge about premarital sex as a factor for acquisition of STIs. Table 3 shows the knowledge of symptoms of STIs. The main symptom mentioned by female patients was discharge while male patients mentioned itching over genitals and genital ulcers as main symptoms. Statistically significant difference was present between male and female patient's knowledge regarding fever, lower abdominal pain, discharge, and painful micturition as symptoms of STIs. Table 4 shows protective practices followed by the study participants. Condom use was mentioned by 34 (73.9%) males and 43 (84.3%) females (by their partners). Statistically significant difference was present between male and female patients practice regarding regular visit to STI clinic. Statistically significant difference (χ^2=6.54,

Fig1. Knowledge of patients about STIs

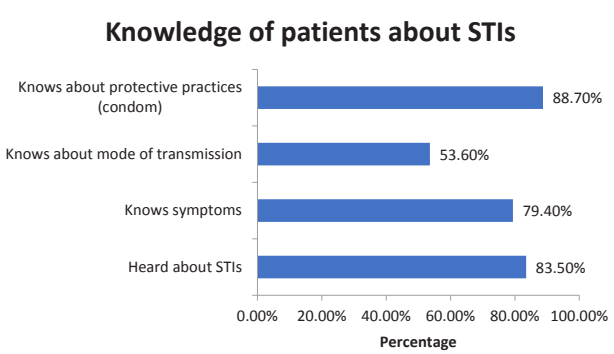

Table 1 Socio-demographic profile of participants.

Variable	Frequency (%)
Age groups	
18-25	24 (24.7%)
26-35	34 (34.1%)
36-45	31 (32.0%)
>46	8 (8.3%)
Education	
Illiterate	37 (38.1%)
Primary	34 (35.1%)
Secondary	17 (17.5%)
Hr secondary	9 (9.3%)
Marital Status	
Married	87 (89.7%)
Single (unmarried, widow, widower)	10 (10.3%)
Occupation	
House wife	24 (24.7%)
Farmers	15 (15.5%)
Laborers	37 (38.1%)
Private job	12 (12.4%)
Govt. job	5 (5.2%)
Student	4 (4.1%)
Religion	
Hindu	76 (78.4%)
Muslim	21 (21.7%)
Residential area	
Urban	58 (59.8%)
Rural	39 (40.2%)

Table 2 Knowledge of factors predisposing to acquisition of STIs

Variables	Male (yes)	Female (yes)	OR (95% CI)	P value
Sexual promiscuity	32	39	0.70 (0.28 to 1.73)	0.59
Multiple sexual partners	37	43	0.76 (0.27 to 2.18)	0.81
Unprotected sex	35	41	0.78 (0.29 to 2.04)	0.79
Sex outside marriage	31	38	0.71 (0.29 to 1.70)	0.58
Premarital sex	28	43	0.29 (0.11to 0.76)	0.01*
Rape	31	37	0.78 (0.33 to 1.87)	0.74

Table 3 Knowledge of symptoms of STIs

Variables	Male	Female	OR (95% CI)	p value
Fever on and off	21	37	0.31 (0.13 to 0.74)	0.1*
Lower abdominal pain	16	43	0.09 (0.03 to 0.26)	0.0001**
Discharge	34	49	0.11 (0.02 to 0.55)	0.005**
Swelling in the groin	31	27	1.83 (0.80 to 4.19)	0.21
Genital ulcers	36	45	0.48 (0.15 to 1.44)	0.29
Skin rashes	12	19	0.59 (0.24 to 1.41)	0.33
Itching over genitals	36	47	0.30 (0.08 to 1.05)	0.09
Painful micturition	22	43	0.17 (0.06 to 0.44)	0.0001*

Table 4 Protective Practices followed by participants

Variables	Male (yes)	Female (yes)	OR (95% CI)	p value
Only one partner	46	51		
Using condoms	34	43	0.52 (0.19 to 1.43)	0.31
Regular visit to STI clinic	23	37	0.37 (0.16 to 0.88)	0.03*
Sex Education	25	33	0.64 (0.28 to 1.46)	0.40
Abstinence	12	18	0.64 (0.27 to 1.55)	0.44

* Statistically significant

Table 5: Difference in knowledge and practice regarding condom use

Knowledge	Condom use yes	Condom use no
Yes	72	14
No	5	6

χ^2= 6.544, df=1, p=0.01*

df=1, p=0.01) was present between knowledge regarding condom to prevent STI and its practice (Table 5).

Discussion

In present study 25% population was below 25 years of age which represents a big share. Other study by Ram, et al reported that a significant no of STI were reported among adolescents.[3] This study finding may have implication on designing interventions at an early age. The majority (38%) of respondents were laborers (factory workers, construction workers) by occupations. Laborers can be at higher risk of developing STIs due to their high risk behavior (sexual promiscuity). This finding suggests that migrants and laborers should be counseled and should get sex education at the site of their work as well as clinic with special attention. Majority of patients were from urban area (60%) this could be due to that most of the laborers may be staying near the city areas. This finding is similar with other study by Mishra A et al.[4]

In present study knowledge about condom use to prevent STIs was fair (88.7%) but it did not match with their real life practices.[5] This finding is in contrast with the finding by Anwar M, and co-authors in their study. Continuous motivation is needed to change their knowledge into practices effectively. The most common symptom reported by female patients was abnormal vaginal discharge and the similar was found by Mishra A et al.[4] Further community based studies are needed to confirm these findings.

Recommendations

Appropriate policy decisions are required for inculcating reproductive health education as an important part of adolescent education as it will have positive impact to decrease STI prevalence and increased awareness regarding STI/HIV among general population.

Limitations of the study

It was a hospital base study and conducted in the STI clinic so that the sample may be biased and could be the cause of fair knowledge about STIs.

Public Health Relevance

This study has relevance in present time because even after the introduction of National STD Control Programme by Govt. of India we have got less success in motivating high risk people to use barrier methods to prevent the spread of STIs. So there is urgent need of change in counseling services at STD clinics so as to bring change in behavior in a sustained manner.

Conflict of Interest None

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Diagnostic Dilemma in Catching Anaemia Early

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Abstract:

Anaemia is major health problem in our country and the foremost cause of disability. The non-specific clinical signs together with lack of knowledge among people are a hindrance for people seeking early care for this disease. Palmar pallor in children for diagnosing anaemia is anaemia has shown to have low sensitivity. Laboratory estimation of haemoglobin levels still are the diagnostic modality of choice in most primary care settings. There are numerous methods based on different principles to estimate haemoglobin. Each method has its own merit and demerit and has to be used appropriately based on that. Some methods like Hemoglobin colour scale have shown have good result to replace Sahli's method but more validation is required. HemoCue also can be used for secondary and tertiary care health institution. A strong political commitment and dedication is required for overcoming operational issues in early diagnosis of anaemia.

Key words: Anaemia, Palmar pallor, HemoCue, Hemoglobin colour scale

Introduction

Anaemia is a significant public health challenge in India. Various national and state health programmes have been there since early 1970 but the burden has almost remained static in our country. In 2012, World Health Assembly Resolution 65.6 Comprehensive Implementation Plan on Maternal, Infant and Young Child Nutrition (CIP), specified a global nutrition target for anaemia reduction by 50% in women of reproductive age (15-49 years).[1] Iron deficiency anaemia is top most condition for disability among Indians accounting for almost 11 percent of disability.[2] As per NFHS 4 almost 60% of under five children were anaemic in India. More than half of pregnant women and reproductive age group females were found to be anaemic. Even males are not completely spared of the disease with almost one in five males being anaemic. Anaemia is associated with increased perinatal mortality, increased child morbidity and mortality, impaired mental development, impaired immune competence and decreased performance at work.[3] Anaemia may have detrimental effects on the health of women and children and is an underlying cause of maternal mortality and perinatal mortality. Anaemia also results in an increased risk of premature delivery and low birth weight. Early detection of anaemia can help to prevent complications related to pregnancy and delivery, as well as child development problems.[4]

The dilemma in anaemia diagnosis

Detection of anaemia has always been a challenge. Barrier to early detection of anaemia stems mainly at three levels.

1. Health seeker
2. Health provider
3. Operational issues

Health seeker

Diagnosis of anaemia can be done clinically but estimation of Hemoglobin(Hb) is the most common biochemical method that has been used for years. Clinical diagnosis always is a challenge for two reasons. The symptoms of mild and moderate anaemia are non-specific and awareness about the symptoms is low in India.[5-7] Most often people neglect the early symptoms because they do not consider it a serious health problem. Long term complication of anaemia is much more clinically evident compared to short term. The reluctance to seek care is more common in people with the greatest health needs.[8-9] In India the burden of anaemia among women, pregnant and children clearly suggest that a large population of our country is susceptible to develop anaemia but the perceived susceptibility from anaemia is not considered significant by people. The Health belie model of anaemia

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is shown below.

Table 1.Proposed health belief model for explaining the barriers at the level of health seeker

Sl no	Concept	Status in anaemia	Reason
1	Perceived susceptibility	Low	Lack of knowledge Nonspecific and non-serious clinical symptoms in mild to moderate anaemia
2	Perceived Severity of anaemia	Low	Lack of knowledge about long term effects of untreated anaemia Nonspecific symptoms which can be attributed to anaemia
3	Perceived benefit of treatment	Low	Lack of knowledge Side effects of drugs
4	Perceived Barriers	High	Side effects of drugs Non-Availability of simple and accurate diagnostic technique
5	Cues to action	Low	Lack of proper counselling by health care providers

Health provider

It is evident that anaemia is a disease that has not been able to catch attention of health seeker mainly due to its insidious nature and non-specific symptoms. The health providers are also face a challenge in diagnosing anaemia early.

Challenges in clinical diagnosis

The clinical diagnosis is difficult in anaemia because the clinical signs are highly subjective and there are high chances of inter-observer variation. Some of the symptoms associated with anaemia are fatigue, head reeling and restlessness which are very nonspecific and health care provider is likely to miss it unless they are highly suspicious about it.

Diagnosis is thus often based on clinical signs alone such as conjunctival, palmar, tongue and nail bed pallor, koilonychia and in severe cases pedal oedema. Detection of pallor is a subjective phenomenon. It is relatively difficult in dark individuals. Moreover palmar pallor may not detect mild pallor thus delaying diagnosis.[10,11] Integrated management of neonatal and childhood illness (IMNCI) has advocated the use palmar pallor for detection of anaemia in under 5 children. Palmar pallor has shown to have poor sensitivity for mild to moderate anaemia among Indian children and thus using only palmar pallor for diagnosis of anaemia is debatable.[12] More over the assessment of palmar pallor remains a subjective phenomenon and its interpretation may vary from person to person. Conjuctival pallor has been seen to be more sensitive sign compared to palmar pallor in certain situation but there has also evidence from India of palmar pallor being more sensitive.[13,14] In a hospital based study done among Indian population to check the accuracy and reliability of pallor in four different sites, tongue pallor was found to have the highest reliability for detecting moderate to severe anaemia.[15] A combination of conjuctival and palmar pallor or pallor at any other site may improve the sensitivity of anaemia detection.

Koilonychia is very specific for moderate to severe anaemia but is rarely seen and may not be easily detected by frontline health worker

None of the clinical signs, whether combined or singly, yield an acceptable diagnostic accuracy in case of mild anaemia.[16] Mild anaemia is rarely detected by clinical means only thus delaying the diagnosis of anaemia

Laboratory diagnosis

Laboratory estimation of Hb still remains the mainstay for diagnosing anaemia. Numerous methods are available for detection of Hb. Each of these methods is based on different principles and each one with its own advantage and disadvantage. If done accurately, it is a much better and objective method for diagnosis of anaemia. Various methods are used in various strata of health care and various surveys conducted in India. Each of the method had its own advantages and its own limitation.

Laboratory Method of estimation of haemoglobin

Basic principles

1. Measurement of its colour (colorimetric method)
2. Measurement of specific gravity.
3. Automated analyzer
4. Noninvasive method

Colorimetric method is by far the most common method used.

Colour comparison between standard and test sample is done by two techniques

1. Visual methods

- Sahlis acid hematin,
- Tallquist hemoglobin chart,
- Hemoglobin Colour scale,

2. Photoelectric methods

- Cyanmethemoglobin method
- HemoCue
- Alkaline Hematin Method

Sahli's method

This is the most common method of estimation of Hb used in most public health sector. Blood is mixed with an acid solution so that Hb is converted to brown coloured acid Hematin. It is then diluted with water till brown colour matches that of brown glass standard. Hb value is read directly from the scale. The advantage of this method is the fact that it is cheap method and can be done in any of the primary health delivery system including a sub centre. There is no need for electricity backup Thus it is the method of choice in most sub centres, PHC, CHC and even district hospitals.

This method is crude and difficult to carry out. There are chances of making visual errors. A minimum waiting time of 5 minutes is required. It also involves pipetting by mouth which itself may introduce errors. Sahli's method has shown to have low mean Hb value compared to Cyanmethemoglobin method or HaemoCue.[17] It may also suffer from logistic issue such as availability of Hcl and hemoglobinometer in working condition.

Hb colour scale (HCS)

The Hb Colour Scale relies on comparing the colour of a drop of blood absorbed on special chromatography paper with standard colours on a laminated card displayed in increments of 2g/dl. It is much easier than Sahli's method and appropriate for resource limited settings without trained manpower or lab facilities. It is also a quick method. The colour reference strip has 4, 6, 8, 10 12 and 14 grams. The cut-off points in pregnancy are 11, 10 and 7 and a modified version may be required to be used in India

HCS developed by HLL (Hindustan Life care Limited), India to screen anemia in community settings have shown promising result but more validation is required.[18]

Tallquist haemoglobin chart

It is much similar to Hb colour scale. Blood is obtained from finger puncture and Placed on a piece of absorbent paper A drop of blood is placed on a strip of blotting paper and the concentration of hemoglobin is obtained by comparing the colour of the blood with a set of colour standards. It is cheap and simple but Error rates are high as matching of standards are pretty difficult and highly subjective.

Direct and indirect cyanomethemoglobinemia method

Direct Cyanmethemoglobin is the most accurate method for estimation of Hb and considered the gold standard. It has been recommended by International Committee for Standardisation in haematology. Blood is mixed with Drabkins solution. Erythrocytes are lysed producing an evenly distributed Hb solution. Potassium ferricyanide converts Hb to methemoglobin. Methemoglobin combines with potassium cyanide to form cyanmethemoglobin. Absorbance is measured in spectrophotometer at 540 nm. To obtain amount of unknown Hb sample, its absorbance is compared with the standard cyanmethemoglobin solution.

The advantage of this process is the fact that there is no chance of any visual error. Cyanmethemoglobin solution is stable and its colour does not fade with time so readings may not be taken immediately.

The biggest disadvantage is that it cannot be carried out field level. It requires a spectrometer and a lab setting for estimation and trained manpower. In case of turbidity one may get in-accurate results. The other disadvantage is the fact that diluted blood has to stand for a period of time to ensure complete conversion of Hb. Potassium cyanide is a poisonous substance and that is why Drabkin's solution must never be pipetted by mouth.

Indirect cyanmethaemoglobin (filter paper) method which is based on the same principle but involves spotting of blood on filter paper which can then be transported to lab for Hb measurement. Certain studies have found that indirect method may show a higher prevalence of anaemia compared to direct and a correction factor was required for making correct estimates.[19]but it may not be feasible under field conditions. Hence, the present study was undertaken to compare indirect cyanmethaemoglobin method against the conventional direct method for haemoglobin estimation. Methods: Haemoglobin levels were estimated for 888 adolescent girls aged 11-18 yr residing in an urban slum in Delhi by both direct and indirect cyanmethaemoglobin methods, and the results were compared. Results: The mean haemoglobin levels for 888 whole blood samples estimated by direct and indirect cyanmethaemoglobin method were 116.1 ± 12.7 and 110.5 ± 12.5 g/l, respectively, with a mean difference of 5.67 g/l (95% confidence interval: 5.45 to 5.90, P<0.001.It has been used in some large surveys in India like DLHS .

Alkaline Haematin method

One of the major constraints of Cyanmethemoglobin method is the fact that the Drabkin's reagents contain potassium ferricyanide and potassium or sodium cyanide which is very toxic, bio hazardous and photosensitive. Disposal constitute a potential bio-hazard problem

In Alkaline haematin method a small volume of blood is mixed with an alkaline solution containing a non-ionic detergent. All haemoglobin derivatives are converted into a stable end-product, alkaline haematin, whose absorption is read and measurement can be taken on colorimeter.

The method has shown good co-relation between cyan-

methemoglobin methods and in future it may be considered as an alternative to it.[18,19]

HemoCue

A HemoCue system consists of photometer and a microcuvette. Small amount of finger prick blood is needed. Blood is placed on a microcuvette and the photometer measures light absorption and presents the results on a display. The photometer can be safely operated between 18 and 30 degrees centigrade. It is an easy procedure and gives quick result. It is suitable for survey. Since cost is high it cannot be considered an alternate to Sahli's hemoglobinometer in resource constrained setting. It has been used in large scale demographic surveys (NFHS). Sensitivity and specificity of HemoCue varies with the type of blood sample-venous or capillary.[18] It has shown a sensitivity of about 70% and specificity 95% of compared to direct cyanmethemoglobin method. It has a higher sensitivity compared to indirect cyanmethemoglobin method when venous blood is used.[21] HemoCue has been considered a good alternative to direct cyanmethhemoglobin method for quick use and accurate result.[22]

Specific gravity method

This method is based on the principle that a donor with normal protein level having a specific density will correspond to Hb levels of 12.5 or more. If the specific gravity of blood is higher than the solution, the drop will sink or else it will remain suspended for some time. It is a qualitative method and has been used for screening blood donors.

Automated analyzer

Automated haemoglobin analyzer are accurate and reliable. Hemoglobin is measured is no cyanide methods. But it is expensive and depends on electricity.

Non invasive Spectrometry

It has been introduced with the aim of preventing pain. This method also minimizes the risk of infection for health care workers, reduces the need for trained personnel, eliminates the generation of bio hazardous waste, cuts down on consumables and is sampling error proof.

Non-invasive Hb tests represent an attractive alternative by eliminating pain and reducing risks of blood contaminate Non-invasive Hb tests represent an attractive alternative by eliminating pain and reducing risks of blood contaminate. Non-invasive Hb tests represent an attractive alternative by eliminating pain and reducing risks of blood contaminate. Non-invasive Hb tests represent an attractive alternative by eliminating pain and reducing risks of blood contaminate Non-invasive Hb tests represent an attractive alternative by eliminating pain and reducing risks of blood contamination. Invasive methods show disadvantages like sensitivity to temperature and change of donors' position. Also their sensitivity in dark individual is doubted.[24] Cost will remain a hindrance for it to implemented in population level screening. Modification and further innovation to this method to make it cost effective may hold some promise in future

Table 2: Summary of the laboratory diagnostic modality modality

Method	Advantages	Disadvantages
Sahli technique	Simple Cheap No electricity required	Inaccurate Colour developed is unstable Inter-observer variability Use of manual pipetting- Tedious and time taking
Haemoglobin colour scale	Simple Portable Electricity not required Cheap	Inter-observer variability. Further validation required
Direct cyan-methemoglo-bin	Measurement of cy-anmethemoglobin, a stable compound Standard reference available	Time consuming Turbidity can deviate the Estimate Cyanide dependent(toxic)
HemoCue	Simple Portable Rapid- immediate result Battery operated Non-toxic Accurate Reliable Easy to use in poor settings where skills and resources are limited	Uses disposable cuvettes which makes it expensive
Automated analyzer	Accurate Easy	Lab dependent Expensive

Operational issues

Anaemia is a disease that has escaped the eyes of policymakers as it is not a direct cause of mortality. None the less, in recent years countries have focussed a lot on prevention and treatment of anaemia. The early diagnosis of anaemia is still a pitfall. In India only, pregnant women are screened for anaemia as a part of their routine MCH care. Other susceptible age groups do not have an existing routine screening programme in . A large no susceptible groups such as under 5 children, adolescent girls and

women in reproductive age group are hardly screened for anaemia until and unless they are present to health facility. Sahli's hemoglobinometer is the most widely method for haemoglobin estimation in India. But it is plagued by operational issues like functional hemoglobinometer and availability of Hcl. Moreover it is time taking procedure and frontline Health workers like Auxillary nurse midwife find it difficult to carry it to outreach sessions like Village health and nutrition day. Haemocue and Indirect cyanmethemoglobin method have been used in demographic health surveys of India, but it has not been planned for routine point of care testing.

The treatment of anaemia in based on Hb cut off levels. In-accurate method of estimation or wrong technique can often lead to over-estimation and under-estimation of Hb and thus effect the treatment modality

The other operational issues is the lack of diagnostic facilities for differentiating between nutritional and non-nutritional anaemia like sickle cell anemia, thallasemia or malaria and TB. Most point of care diagnostic modality cannot make distinction between nutritional and non-nutritional anaemia. Point of care testing for sickle cell anaemia are under development and initial test have shown promising result.[25] Similar test are under development even for Thallasemia.

Recommendation

1) Prevention and treatment of anaemia has been already being given due importance in our health policy. The health belief model clearly suggests that there has to be a focus on targeting the susceptible population and increasing their awareness about the severity and long standing morbidity associated with disease. VHND forums must be utilized to have targeted learning for pregnant women, adolescent girls and under 5 children about signs and symptoms of anaemia and the long-term morbidity issues in anaemia.

2) IMNCI could advocate the use of at least on more clinical sign together with palmar pallor to increase the sensitivity of anaemia detection. (Conjuctival pallor may be used in parallel with palmar pallor)

3) A study done to compare various laboratory methods of Hb estimation found that on the basis of simplicity, speed, accuracy, and short training times, HemoCue was the most appropriate method and may be introduced as the standard haemoglobin technique in all district hospitals However, the high recurrent costs of this test may be a hindrance in implementing it at sub district level[26].

4) Hb Colour scale has shown certain promise in primary health care setting and may replace Sahli's hemoglobinometer in sub district level. It is easy to perform and interpret and also potable. A meta-analysis has shown that a pooled sensitivity of 80% compared to around 50% in clinical diagnosis. More studies are required to check its reliability in Indian settings.

5) Research should focus on developing point of care testing for non nutritional causes of anemia like thallasemia and sickle cell disease.

Conclusion

Anaemia remains a challenge for India and other countries. Early diagnosis can aid in early initiation of treatment. A knowledge gap is a hindrance for early diagnosis. Numerous laboratory methods are available for Hemoglobin detection and appropriate method which is cost effective and accurate has to be selected. The various methods need proper validation before programme based implementation It is time to focus on a timely detection and proper management of anaemia which can and improve the health status and fulfil our dreams of Anaemia mukt Bharat.

Conflict of interest - None

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CASE REPORT

A Case of Pseudomembranous Colitis Presenting with Reactive Arthritis

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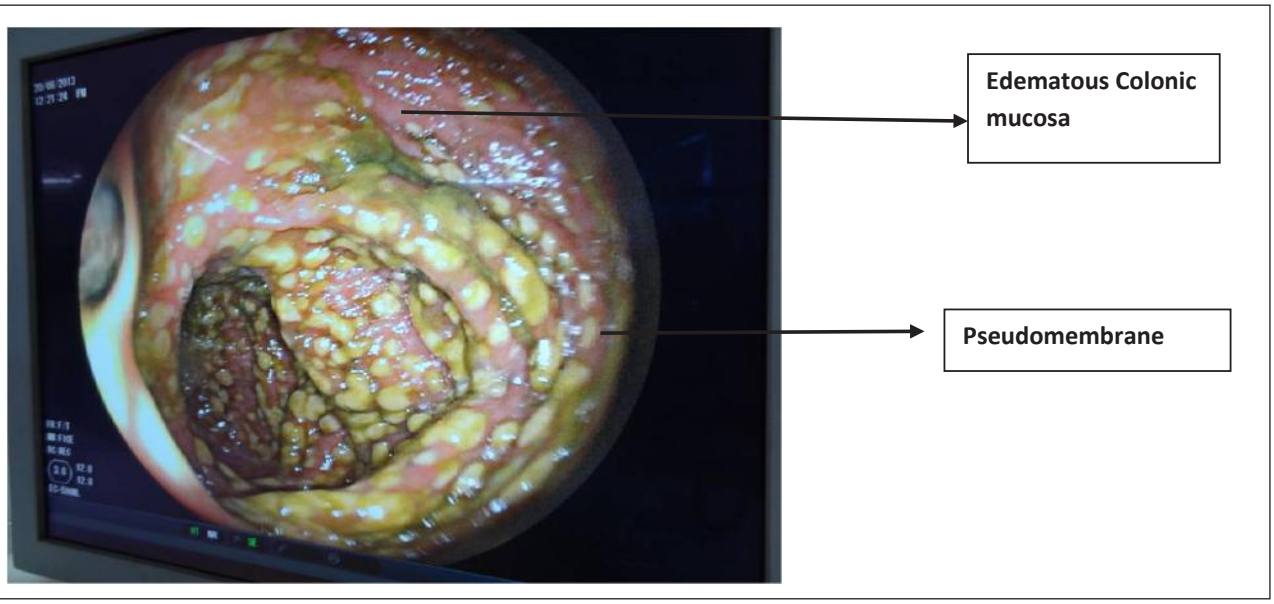
Introduction

Reactive arthritis usually occurs after enteric infections. Very few cases of Clostridium difficile colitis related reactive arthritis have been reported so far.[1] Recent history of antibiotic use is the commonest risk factor for Clostridium difficile infection. We are describing here a case of post antibiotic pseudomembranous colitis related reactive arthritis.

Case Report

A 60-year-old male presented with intermittent loose motion 3 to 4 times a day and crampy abdominal pain for 7 days, without vomiting, abdominal distention, or burning urination. He had taken Azithromycin for sore throat 5 days prior to this event. He also complained of pain and swelling of left knee and ankle joint with restricted movement of the affected joints without morning stiffness for 5 days for which he was treated with cephalosporin and NSAID but his condition deteriorated with increased stool frequency up to 8-10 times/ day without any relief of joint symptoms. There was no history of similar complaints in the past. There was no history of trauma to the joint, promiscuous sexual activities, rash, red eyes, urethral discharge, painful urination, or oro-mucosal ulcerations. At the time of hospitalization, physical examination revealed: temperature of 100.8°F, pulse rate of 106/min, tender and swollen left knee and ankle joint with restricted joint movements without any signs of joint effusion or, lymphangitic streaking. He had normal systemic examination findings. Biochemical investigations revealed: Total leucocyte count: -34,420/cmm, Erythrocyte Sedimentation Rate: -45 mm/1 hr), Hemoglobin: -10 gm%, Urine (Routine and microscopic analysis): pus cells -1 to 3 / hpf, Stool (Routine and microscopic analysis): pus cells- 30 to 40 / hpf, Serum Uric acid: - 6 mg/dl. X–rays of affected joints: - soft tissue swelling. Ultrasonographic

Figure 1: Colonoscopic image of Pseudomembranous Colitis



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study of abdomen and pelvis revealed: - diffuse concentric thickening of large bowel loops. Colonoscopy findings revealed presence of edematous colonic mucosa with overlying elevated yellowish plaques (pseudomembrane) distributed throughout the whole colon. The Colonoscopic findings are shown in figure 1.

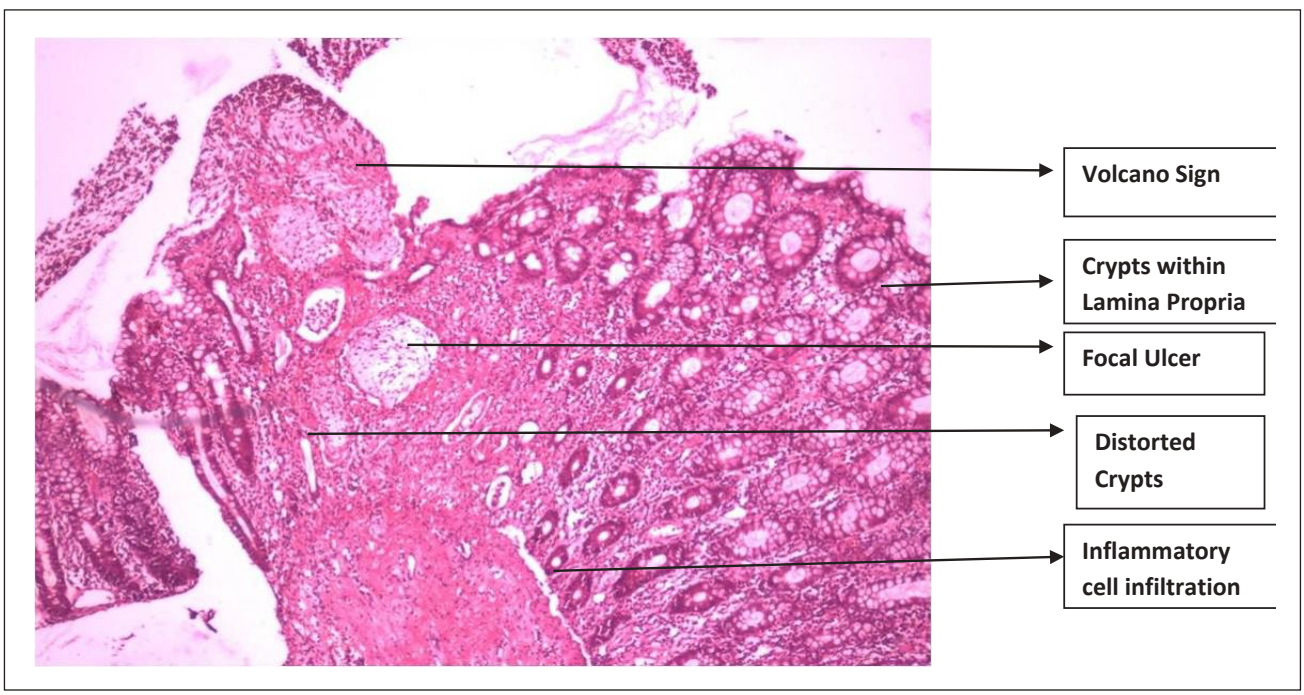
Histopathological analysis of colonic mucosa revealed presence of patchy destruction of surface-lining with many goblet cell lined mucosal crypts, release of mucinous materials from the crypts with moderately dense infiltration of polymorphs and hemorrhages, presence of pseudomembrane with pathognomonic volcano sign. The histological findings are shown in the figure 2. The suspected antibiotics (Azithromycin and Cephalosporin) were withdrawn as soon as the diagnosis was made and the patient was treated with intravenous fluid, oral vancomycin (500 mg 4 times daily for 10 days), intravenous followed by oral metronidazole (500 mg 3 times/ day for 10 days), and NSAID for 7 days. The diarrhea and joint symptoms improved completely after 8 days of treatment with metronidazole and vancomycin. The patient was subjected to follow up colonoscopic study after 21 days which revealed normal colonic mucosa.

Discussion

Antibiotic related colitis occurs due to altered activity of normal gut commensals leading to growth of pathogenic bacteria - usually with toxicogenic Clostridium difficile.[2] Patients usually suffer from loose motion within 3 months of intake of antibiotics. Diagnosis usually rests on presence of Clostridium difficile toxin in the stool detected by ELISA. Other adjunctive diagnostic modalities are colonoscopy study and histopathological analysis of colonic lesions. Presence of raised yellowish plaques (pseudomembrane) over inflamed colonic mucosa along with the presence of volcano sign usually confirms the diagnosis of Clostridium difficile induced pseudomembranous colitis. This type of diarrhea usually responds to oral/ intravenous Metronidazole and oral Vancomycin.[3] Clostridium difficile related reactive arthritis usually involves the large joints of the lower extremities and manifests within 1-4 weeks of the infectious insult. Perhaps colonic inflammation allows certain gut antigens to cross the mucosal barrier, resulting in synovitis and immune-mediated joint disease.[4] Most published cases have reported the presence of pauciarticular arthritis as found in our case. Clostridium difficile usually produces two types of toxins: toxin A and B. Toxin A is responsible for increased intestinal epithelial permeability which paves the way for initiation of immune complex deposition in the synovium leading to reactive arthritis. Toxin B is the more potent virulent factor compared to toxin A and produces greater colonic damage compared to toxin A.[5] Our patient possibly had both toxins 'A and B', as there was florid affection of the entire colon along with joint manifestation in our case.

Our case report is different from other published case reports, as we have found typical colonoscopic findings along with presence of pathognomonic summit (volcano) sign in histopathological study,[6,7] which characterize clostridium Difficile related pseudomembranous colitis, which were rarely reported in previous published case reports so far. [1,8,9,10]

Figure 2: Histological appearance of Pseudomembranous Colitis with Volcano sign (H & E stain, Magnification 4O X)



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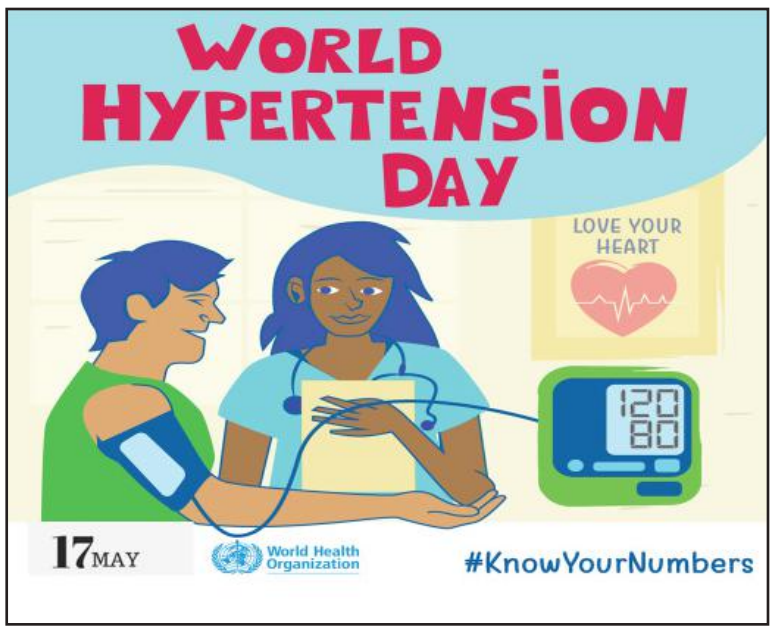

Public Health Update: January - June, 2018

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Medicine is an ever-evolving field where every medical professional has to be on their toes with regards to new advancements across the globe, constantly brushing up on their current knowledge with health-related updates in the form of new guidelines, reports, schemes and healthcare events. This article gathers important updates from January to June 2018 on the international, national and regional front.

International updates

Events

The World Health Organisation (WHO) celebrated 'World Health Day' on 7th April with theme 'Universal Health Coverage: Everyone, everywhere' It implies easy accessibility and quality of health services through inspiring policy makers, motivating countries through the progress of other countries and guidance by providing policy advocacy tools.[1] Even as steps are being taken to eliminate diseases, outbreak like Ebola in Congo which was confirmed on May 8 remain a challenge. 29 patients died out of the 53 cases with a case-fatality rate of 54%. Ring vaccination protocol with rVSV-ZEBOV vaccine and exit screening was done at all International and domestic ports and airports and location beyond borders where travellers congregate to prevent spread of disease.[2] In addition to this, a polio outbreak occurred in Papua, New Guinea after 18 years of Polio-free certificate in late April which was confirmed in May. The circulating virus is cVDPV type-1 detected from a 6-year old victim and 2 healthy children.[3] Another outbreak in Congo by cVDPV type– 2 virus by April in addition to 2 cases detected last year after which mOPV vaccination campaign is being conducted.[4]

Guidelines

To ensure universal health coverage, WHO released the first-ever list of Essential Diagnostic tests which is a catalogue of 113 invitro tests needed to diagnose the most common conditions (58 tests) and Global Priority diseases (55 tests).[5] As an extra step for EndTB strategy WHO released guidelines for programmatic management of latent TB infections such as: a) Inclusion of HIV-negative children >=5 years, adolescents and adults in contact of MDR-TB patients, b) Use of Tuberculin Test or Interferon Gamma Release Assay, c) Introduction of two shorter regimens (Rifampicin + Isoniazid and Rifapentine + Isoniazid)[6]. New 6 month treatment regimen is recommended for Isoniazid-resistant TB with Levofloxacin, Rifampicin, Ethambutol, Pyrazinamide.[7] A shortened antirabies post-exposure prophylaxis for non-immunized category 2 and 3 bites, 2 sites intradermal(id) on days 0,3,7 was recommended by WHO while the previous guideline is still considered valid.[8]

To reduce prevalence of non- communicable diseases, WHO launched Plan REPLACE, a guide for elimination of industrially produced trans-fatty acids, (a primary risk factor) by 2023. REPLACE provides 6 strategies: - Review of dietary sources for policy change, promotion of healthier fats, legislation to regulate industrially produced fats, assess and monitor trans-fat content in food supply, create awareness among the public and enforce compliance of policies and regulations Another risk factor, tobacco consumption was addressed with guidelines released for implementing Tobacco testing and a laboratory guide to test tobacco products and use the data in regulation by WHO.[9,10]

Reports

Reports indicate progress of the state and bring to notice the shortcomings. India ranks 177 on the 20th Environmental Performance Index (EPI) published on January 23, having slipped by 36 points from 141 in 2016. The index ranks 180 countries on 24 performance indicators across 10 issue categories covering environmental health and ecosystem vitality.[11] The WHO published Air Pollution Report 2018 in which 14 of the world's most polluted cities were in India where Kanpur was ranked the first among the world cities while Delhi was ranked sixth and among the megacities, Delhi ranked first while Mumbai ranked fourth in pollution.[12]

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National updates

Events

The state of Kerala faced an outbreak of Nipah virus with no available vaccine or cure on May 22 which claimed 16 lives. The state curbed the outbreak with quarantine of over 2000 people which has now been lifted with the state's current virus-free status. For this, The Institute of Human Virology, Baltimore co-Founder Dr. Robert Gallo presented the Chief Minister of Kerala Mr. Pinarayi Vijayan and Health Minister K K Shylaja with awards.[13,14]

Guidelines

A revolutionary decision was taken, as passive euthanasia and living will was legalised on 13 March by Supreme court leading to expansion of 'Right to life' Article 21 with 'Right to die with dignity'. The person concerned can authorise through the living will any relative or friend for taking decision when to terminate in consultation with doctors. Strict guidelines are laid to prevent misuse of living will.[15]

Reports

The Ministry of Health and Family Welfare(MoHFW) launched the National Health Resource Repository (NHRR) which is India's first ever authentic, standardised and geo-spatial data updated national healthcare facility registry on June 19.[16] Along with this the 'National Health Profile' (NHP)-2018 prepared by the Central Bureau of Health Intelligence(CBHI).[17] The National Institution for Transforming India (NITI Aayog) released a Health Index report on Feb 9 titled "Healthy State, Progressive India" which ranks States and Union territories on health outcomes. It covers three domains: Health Outcomes, Governance and Information and Key Inputs/Processes.[18] AIIMS Bhubaneswar has been ranked the 2nd best hospital in the country for cleanliness amongst B category hospitals and was awarded Rs. 1 crore under the 'Kayakalp' scheme-towards total "Swacchta" in public health facilities.[19]

Schemes

To ensure quality health care services for the poor, the Central Government launched 'Ayushman Bharat Yojana' or the 'National health Protection' scheme on April 18. It includes a) establishment of Health and Wellness centres b) National health protection scheme-5 lakhs insurance coverage and cashless treatment facility from empanelled hospitals for elligible patients.[20] The foundation stone for National Centre for Ageing was laid at AIIMS, New Delhi which aims to provide good clinical care to elderly population through guiding research in the field of geriatric medicine and expected completion is by February 2020.[21] Also, the 'Viral load testing' initiative launched on Feb 27 by MoHFW will provide free of cost viral load testing for 12 lakh People living with HIV (PLHIV) on treatment, at least once a year. It will help to monitor effectiveness of treatment of patients, optimize utilization and detect failure rate of first-line regimen, thus preventing PLHIV from developing drug resistance. Left to follow up can be traced by linking this with 'Mission Sampark', an initiative aimed at fast-tracking the identification HIV positivepatients.[22]

The 'LaQshya' initiative to improve quality of Maternal care is to be implemented in all public health insittutions. The NQAS (National Quality Assurance Standards) will monitor quality improvement in labour room, Obstetric Intensive Care Unit and maternity Operation Theatre. Every facility achieving 70% score on NQAS will be certified as LaQshya certified facility.[23] The 'I Pledge For 9' Achievers Awards is awarded to the individuals and teams of Doctors from the Private sector and States for their exemplary services, outstanding support of institutions and commitment under the Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA).[24] based on Sample Registration System released Maternal Mortality Bulletin for 2014-16.[25] Madhya Pradesh was awarded for decrease in Maternal mortality rate by 48 from 221 to 173. India has 22% reduction in maternal mortality ie. From 167 to 130 deaths per 1 lakh live births.

Regional updates

Schemes

An online platform Odisha e-Hospital Management Information System (OeHMIS) was launched to provide efficient and hassle-free health services in the form of online registration, availability of electronic health records.[26] Other new healthcare schemes launched are, Nirmal- to strengthen sanitation, security and other public health services, Sunetra- to provide free Universal Eye Healthcare to all, and Sampurna Suraksha Kabacha- to provide institutional delivery kits to the mother and her baby with a daily allowance of Rs. 50 to Rs.100 per day to mothers of children admitted to Nutritional Rehabilitation Centre's redressal of grievances.[27] The government has planned at raising 20 hospitals through Public-Private partnership in 19 districts of the state with 2700 beds, 10,000 employment opportunities with Rs. 1000 crore investment and a claim to reduce hospital bed shortage by 56%.[28] Rejecting the 'Ayushman Bharat Yojana' scheme, the Odisha government has announced the 'Biju Swasthya Kalyan Yojana' (BSKY) scheme, a fully state-funded scheme on June 12, to be implemented from August 15 claiming that the new scheme benefits 71 lakhs families, 9 lakhs more than the central scheme. It provides 5 lakhs per family year, 7 lakhs in case of female beneficiaries, free health services for beneficiaries in public hospitals and 30 empanelled private hospitals with drop-back pay of Rs. 500 is given for pregnant and sick children. Beneficiaries are families below poverty line, farmers without IT returns and families without salaried member.[29]

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Unravelling Early Onset of Atherosclerosis in Young Asymptomatic Individuals using Physiological Parameters - A Way Forward

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Abstract

Introduction: India is burdened with 25% of cardiovascular disease-related deaths. CHD manifests almost 10 years earlier on an average in Indian subcontinent. **Objectives:** to study the early onset atherosclerosis in young, asymptomatic individuals using physiological parameters. **Material & Method**: 31 young, asymptomatic males of age group of 21- 40 yr participated in this cross-sectional, observational study. The basic characteristics and anthropometric measurements of the subjects were obtained. Baseline blood pressure was recorded and Mean Arterial Pressure (MAP), pulse pressure (PP) were calculated. The arterial stiffness was assessed by recording central systolic blood pressure (central SBP), central diastolic blood pressure (central DBP) and augmentation index by arteriography. Ankle-brachial index was also measured. The data were presented as median (range). **Results:** 31 male subjects of 21-40 years of age participated in the study. Participants were grouped into lower age group [group A (21-30 yr), n=14] and higher age group [group B (31-40 yr), n=17]. More subjects (71.14%) of group B were in overweight-pre-obese-obese group than in group A (64.69%). Considering waist-hip ratio (WHR), more subjects of group A (94.11%) had low estimated health risk than group B (85.71%). Interestingly, SBP of 11.8% and DBP of 5.9% subjects of group A were higher, but none had higher SBP and DBP in group B as per JNC 8 criteria. The lower limit of central SBP and DBP were slightly more in group B than group A. Augmentation index value was within normal range in both groups. Ankle Brachial Index (ABI) of 14.3% of subjects of group B was indicative of mild to moderate degree of peripheral vascular disease. **Conclusion:** The important findings in this study have significance in practice as atherosclerosis eventually leads to serious consequences such as an MI or Stroke.

Keywords: Atherosclerosis, Mean Arterial Pressure, Ankle Brachial Index

Introduction

The incidences of cardiovascular disease related death and disability are increasing in developing countries at alarming pace.[1] India alone is burdened with 25% of CVD-relateddeaths.[2] Most of CVD sufferers are in productive age group in India and that imposes tremendous socioeconomic burden and devastating consequences over the coming years.[3] Though manifestation of CVD occurs after 40 years of age, atherosclerotic changes begin early in life as demonstrated by necropsy studies.[4] It was reported that CHD manifests almost 10 years earlier on an average in Indian subcontinent in comparison to rest of the world.[5] Therefore, it is the need of the day to develop effective tools to identify young individuals who are otherwise asymptomatic but at risk of developing CVD for timely prevention and treatment at early stage.

Several prediction models have been proposed to estimate a 10-year risk of developing CVD in past decades. Framingham Risk Score (FRS) is one such prediction model to estimate risk for developing CVD. FRS predicts CHD using traditional risk factors namely age, diabetes, smoking, systolic blood pressure (SBP), treatment for hypertension, total cholesterol and high-density lipoprotein (HDL) cholesterol.[6] The individuals are risk-stratified based on these models. However, considerable number of CVD events occurs in asymptomatic individuals who are otherwise stratified in intermediate or low risk strata. They may suffer from undiagnosed substantial

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atherosclerosis which itself is the main cause of CVD.[7] Therefore, it is imperative to incorporate or modify risk factor that has an early predictive value in a given population. Enhanced peripheral blood pressure is a known cardiovascular risk factor. Although diastolic and mean arterial pressures are relatively constant, systolic pressure may be up to 40 mm Hg higher in the brachial artery than in the aorta. This occurs because of increase in arterial stiffness moving away from the heart.[8] Increasingly, the importance of central blood pressure (Central BP) is recognized over and above peripheral blood pressure as a cardiovascular risk factor. Increased arterial stiffness will enhance pulsatile component of blood pressure, which in turn modulates atherosclerosis progression. Central BP waveform is a sum of a forward travelling wave, by and a reflected wave coming back from periphery. Central pulse pressure ≥50 mm Hg carries greatest risk of future cardiovascular event.[9] Augmentation pressure is calculated as SBP (the peak of the observed wave) minus the peak of the forward waveform. Thus, Augmentation pressure represents additional SBP due to wave reflection.[10] Ankle-brachial index (ABI) is defined as the ratio of systolic pressure of the ankle to that in the arm. It is another parameter to evaluate changes in the blood vessel and is utilized for measuring peripheral vascular disease. An abnormal low ABI (≤0.90) indicates the presence of peripheral artery disease, while an abnormally high ABI (≥1.40) is indicative of vascular calcification.[11] ABI is documented as an indicator of generalised atherosclerosis because lower levels have been associated with higher rates of concomitant coronary and cerebrovascular disease, and with the presence of cardiovascular risk factors.[12] A community-based study concluded that higher Augmentation Index, a measure of arterial stiffness and wave reflection was independently associated with a lower ABI. The results of this study added to the growing body of evidence linking measures of arterial stiffness/wave reflection to subclinical atherosclerotic vascular disease.[13] To this end, the present study aims to determine early onset atherosclerosis in young, asymptomatic individuals using physiological parameters namely determination of SBP, DBP, MAP, PP, central blood pressure, augmentation index and ankle-brachial index. It was reported that measurement of the ankle brachial index may improve the accuracy of cardiovascular risk prediction beyond the Framingham Risk Score. Furthermore, it was suggested that development and validation of a new risk equation incorporating the ankle brachial index is warranted.[14]

Material & Methods

The present study is a cross-sectional, observational, pilot study. The participants were young, asymptomatic males of age group of 21-40 yr. working with AIIMS Bhubaneswar as residents and administrative staff. Those subjects were included in the study who had no history of dyslipidemia, hypertension, diabetes and peripheral vascular disease. The subjects having history of chronic renal disease, chronic inflammatory condition, and suspected neoplasm were excluded from the study. 31 subjects participated in the study. The necessary ethical clearance was obtained from Institute Ethical Committee (IEC Reference no. IEC/AIIMS BBSR/STS_UG/2018-19/03). The subject information sheet was handed over to the participant and informed consent was taken from them. The data collection form as approved by Institute Ethics Committee was utilised to record information pertaining to relevant family history, anthropometric measurements such as height, weight, BMI, waist-hip ratio. The height was measured with the stadiometer following the standard protocol, weight was measured using weighing machine using the standard protocol. BMI was calculated as per the formula [wt in kg/ht^2 (in m)] using the parameters weight (kg) and height (m). The hip circumference was measured around the widest portion of the buttocks. The waist was measured as midpoint between lower margin of the last palpable rib and the top of the iliac crest. Afterwards the ration of waist and hip was calculated. The subjects were asked to report in Clinical Physiology Laboratory of Department of Physiology and were requested to refrain from tea, coffee 2-3 h before the test. After 15 min of rest in supine position, baseline blood pressure were recorded by mercury sphygmomanometer (Diamond, India) following standard protocol. Mean arterial blood pressure and pulse pressure were calculated from the recorded blood pressure data. The arterial stiffness was assessed by recording central aortic systolic and diastolic blood pressure and augmentation index by arteriograph [USCOM make BP + (cardioscope II), Australia]. Ankle-brachial index is the ratio of systolic pressure of the ankle to that in the arm. Accordingly, systolic pressure at brachium and ankle were measured using oscillometric blood pressure measuring equipment. The ABI value was determined by taking the higher pressure of the 2 arteries at the ankle (Posterior Tibial artery), divided by the brachial arterial systolic pressure. In calculating the ABI, the higher of the two brachial systolic pressure measurements was used.[15] The data were entered in Microsoft excel sheet (Microsoft Excel 2013, Microsoft Corp., and Redmond, WA) and necessary calculations were done. Finally, the data were presented as median (range).

Results

Total 31 male subjects of age group of 21-40 years participated in the study. 7 participants gave the family history of myocardial infarction, hypertension and diabetes. The total number of participants were divided into two subgroups, group A (n=17) comprising of subjects of 21 to 30 years of age and group B (n=14) comprising of subjects of 31 to 40 years of age. The data are expressed as median (range). Table 1 shows height, weight, BMI and waist-hip ratio of the participants. Waist-hip ratio (WHR) was also computed and cut-off value ≤ 0.9 was regarded as

Table 1:Height, weight, BMI and Waist-hip ratio of the participants

Group	Height (cm) Median (range)	Weight (kg) Median (range)	BMI Median (range)	Asian Criteria of BMI cut off	Waist-Hip Ratio (WHR) Median (range)	Normal WHR for male (≤0.9) (WHO criteria, 2000)
A (n=17)	166 (182-156)	67 (92-48)	23.8 (30.9-18.7)	Healthy (18.5-22.9):35.29% Overweight (23-24.9):35.29% Pre-obese (25-29.9):23.52% Obese (≥30): 5.88%	0.879 (1.01-0.587)	>0.9 WHR : 35.29%
B (n=14)	163.5 (181-154)	69.5 (87-49)	25.25 (31.2-19.6)	Healthy (18.5-22.9)):35.71% Overweight (23-24.9):7.14% Pre-obese (25-29.9):50% Obese (≥30):7.14%	0.912 (0.97-0.866)	>0.9 WHR : 78.57%

*Group A: 21 to 30 years of age *Group B: 31 to 40 years of age

Table 2: Resting Blood Pressure, Pulse Pressure and Mean Blood Pressure of the study subjects taken at the level of brachial artery

Group	Resting Systolic BP (mmHg) Median (range)	As per JNC 8 criteria (Pharmacological Intervention)	Resting Diastolic BP (mmHg) Median (range)	As per JNC 8 criteria (Pharmacological Intervention)	Mean Blood Pressure (mmHg) Median (range)	Pulse Pressure (mmHg) Median (range)
A (n=17)	118 (142-88)	Required: 11.8 % Not required: 88.2 %	78 (96-50)	Required: 5.9% Not required: 94.1%	92 (108-62.66)	42 (54-32)
B (n=14)	120 (126-110)	Required: 0 % Not required: 100 %	78 (88-70)	Required: 0 % Not required: 100 %	92.33 (100.66-86)	39 (50-32)

*Group A: 21 to 30 years of age *Group B: 31 to 40 years of age

**As per JNC 8 guidelines the pharmacological treatment for hypertension should begin when the systolic BP is 140 mmHg or above and diastolic BP 90 mmHg or above.

Table 3: Central Blood Pressure, Augmentation Index and Ankle Brachial Index of the study subjects which correspond to the arterial stiffness status of an individual

Group	Central Systolic BP (mmHg) Median (range)	Central Diastolic BP (mmHg) Median (range)	Central pulse pressure ≥50 mm Hg	Augmentation Index (%) Median (range)	Ankle Brachial Index (ABI) Median (range)	Severity of peripheral artery disease as per ABI value
A (n=17)	113.8 (132.1-90.8)	80.9 (91.1-63.2)	0%	50 (93-21)	0.98 (1.14-0.9)	>1.2 (vascular calcification):0% 0.9-1.2 (normal):100% 0.5-0.89 (mild to moderate):0% <0.5 (severe):0%
B (n=14)	113.05 (121.7-97.5)	82.5 (91.7-69.1)	0%	52.5 (66-30)	0.96 (1.05-0.83)	>1.2 (vascular calcification):0% 0.9-1.2 (normal):85.7% 0.5-0.89 (mild to moderate):14.3% <0.5 (severe):0%

*Group A: 21 to 30 years of age *Group B: 31 to 40 years of age

normal as per WHO criteria, 2000. These anthropometric indicators tell us about the obesity and atherosclerosis risk. Table 2 shows the resting blood pressure, pulse pressure and mean blood pressure of the study subjects taken at the level of brachial artery. The percentage of subjects required pharmacological intervention as per JNC 8 criteria was shown in Table 2. Mean Blood Pressure (MBP) and Pulse Pressure (PP) of both groups were within normal limits. Table 3 shows central blood pressure and augmentation index of the participating study subjects. Central systolic BP was lower than peripheral systolic BP in both groups. But central diastolic BP was little higher than peripheral diastolic BP in both groups. The lower limit of central systolic and diastolic blood pressure is slightly more in group B than group A. Ankle Brachial Index (ABI) was found to be within normal range in group A. But 14.3% of participants in group B were detected to suffer from mild to moderate grade of peripheral arterial disease which is a known cardiovascular risk factor.

Discussion

Atherosclerosis begins at a quite early age, which is invariably associated with risk factors, and it is largely preventable.[16] One of the major risk factor for developing atherosclerosis is hypertension because of which systolic and diastolic BP of both brachial artery and central artery have been measured in this study.[17] Hypertension also has a higher risk for development of greater number of plaques as compared to normotensive individuals due to endothelial alterations which predispose the individual to various inflammatory processes and cholesterol deposition.[18] Overweight and obesity are other major culprits.[19] Therefore, height, weight, BMI and waist-hip ratio of the participating subjects have been measured in this study.

There are documentary evidence which helps to postulate that hypertension predisposes to and accelerates atherosclerosis partly because of synergy between elevated blood pressure and other atherogenic stimuli to induce oxidative stress on the arterial wall.[20] The resting brachial artery pressure in both groups is in normal range of 120/80 mmHg or below but ironically the highest systolic and diastolic BP was recorded from younger age group. It may be due to family history, early use of tobacco, consumption of alcohol or due to overweight. Arteries are permanently exposed to a basal stretch, which is related to mean BP, and to a pulsatile stretch owing to pulse pressure (PP). Cyclic changes in the intramural tension have been recognized an important factor in the pathogenesis of atherosclerosis and acute coronary syndromes.[21] Therefore, in the present study, mean blood pressure and pulse pressure of the subjects were being measured. The mean blood pressure of individuals of both the groups was falling in normal range of 70 to 110 mmHg. A minimum of 65 mmHg of mean blood pressure is sufficient to ensure enough perfusion of organs. The range was quite large in lower age group. The inference from this is inconclusive. The pulse pressure was almost similar in both the groups. Since persistent elevated pulse pressure over 100 mmHg is considered significant, which neither of the groups of individuals show, therefore it is not much of any significance.

Relations of brachial and central pressures to carotid artery hypertrophy (intimal-medial thickness and vascular mass), extent of atherosclerosis (plaque score), and incident cardiovascular events were examined in the Strong Heart Study. Among 3520 participants, central and brachial pulse pressures were more strongly related to vascular hypertrophy and extent of atherosclerosis than were systolic pressures.[22] So, in the present study central systolic and diastolic blood pressure were measured. The average central systolic and diastolic blood pressure seem to be in normal range even though there are no specific guidelines, which particularly state the threshold value for central BP. A point to be noted here is that the lower limit of central systolic and diastolic blood pressure are slightly more in upper age group (31-40 years) than younger age group which may signify the aging process of the artery making it more stiff with time. Central pulse pressure ≥50 mm Hg imposes greatest risk of future cardiovascular event. The Augmentation Index of individuals of both the groups was around 50%. But the upper and the lower limits are very extremely separated in the younger age group (21-30 years). In Korean population, reference value for peripheral AI (%) was reported for ≤39 yr as 81.2 % and for 40-49 yrs., 89.2%. [10] Not much information about the reference values of this parameter are available for the population of India, especially Odisha as it may vary from population to population for which this data may be of significance. Since Ankle-Brachial pressure index is an indicator of peripheral arterial disease whose incidence increases with age, thereby it is evident in this study population that the older age group had relatively lower ABI slightly below 0.9. BMI of both groups on an average is around 25 or below which is normal according to WHO Asian criteria. This is still not a very reliable indicator because it does not tell us about what percentage of body is fat as cited in the Y-Y paradox of a WHO published article.[23] The normal waist-hip ratio should be below 0.90 in men but there were many deviations from this. The subjects of 31-40 years were with slightly higher values indicating more abdominal adiposity.

Conclusion

The study overall indicated many parameters which are relevant in knowing the risk of developing atherosclerosis in otherwise young asymptomatic individuals. The important findings in this study as stated above have significance in practice as atherosclerosis is the silent disguised process, which eventually lands up in serious deadly consequences such as an MI or Stroke. The importance in knowing the risk factors and controlling it is the key to prevent such

unforeseen events, which is a debilitating burden to the family members and the welfare of the society. At this juncture, it is of paramount importance to create awareness regarding self-health check up so that the risk factors can be detected early.

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SUCCESS STORY

A tireless journey towards the service of women and children in tribal areas of Odisha: The story of an Auxiliary Nurse Midwife (ANM)

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In the rural healthcare system, an Auxiliary Nurse Midwife (ANM) is the key field level functionary who interacts directly with the community and has been the central focus of all the reproductive child health programmes. The ANM is the first contact point between the primary health care system and the community.

We came across one such ANM- Udasi Sahu, during our visit to Keonjhar district, Odisha in November 2017 who has come to the District Head Quarter Hospital for INAP(India New born Action Plan) training. To our utter surprise, the silent, sober, frail looking Udasi, by then, has been conferred with so many prestigious awards including President's Award for best ANM in 2012 about which we were unaware. Overwhelmed, by her soberness, eagerness to learn new things and undefeatable willingness to serve the poor & neglected tribal folk, the authors decided to take her inspiring story to a larger section of reader.

The initial days.....

Udasi Sahu, got her first governmental posting in the year of 1997 as an ANM in Mandal health sub-centre of Belpada CHC in Bolangir district. The area had high infant and

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maternal mortality and poor health indicators like very low immunization coverage, huge number of home deliveries. The young ANM first decided to dispel the entrenched fears among the community in accepting immunization for pregnant women and children. She visited the beneficiaries from house to house, often facing humiliations and insults by other family members, for persuading their "Nua Bohus"- the newly-weds or the young mothers, in getting vaccinated and ensuring immunization of their small children. Immunisation, by a kind of injection to the healthy babies and pregnant women, was not traditionally welcomed by these rural communities. Udasi gradually won over the trust & confidence of all the pregnant women and mothers of small children in her area through her regular home visits, personal interactions with the beneficiaries, and continuous persuasion of the decision making members of the family. In her efforts, she met with the community leaders, the village headmen, the husbands and mother-in-laws of the beneficiaries and other government officials like school teachers, Gram Sevak and won their support in mobilizing the larger communities and spreading health messages. In order to make the communities accept immunizations, she adequately skilled herself in administering injections so painlessly that, often the beneficiaries did not realize when they had been pricked with an injection. The efforts of Udasi did not stop at this point. She also worked on family planning and motivated communities in deciding their family planning options and promoted modern methods of family planning. For the commendable work in promotion of immunizations and family planning initiatives, the young ANM was then rewarded and appreciated by the secretary of Health and Family Welfare Department, which further motivated her to carry on with her laudable efforts.

Udasi sahu is not less than a saviour for the pregnant mother residing in the hard to reach-hilly terrain. Since the initial days of her service, she had witnessed numerous cases in rural Odisha, where many lives of women and new-borns could have been saved by some skilled assistance during delivery, be it at home or at hospitals. She has got trained in Skilled Birth Attendant (SBA), Integrated Management of Neonatal & Childhood Illnesses (IMNCI) and Nabajatak Shishu Surskhya Karyakram (NSSK) adopted by National Rural Health Mission (NRHM), Odisha in order to improve Maternal & Child Health through trained attendants.

'I believe in God and my values are rooted in a religion, which has taught me that every mother/woman is an incarnation of MaaTarini (Goddess worshiped by most of the Odias). So I take utmost care in saving the lives of such women in critical moment. And, this inspired me to support deliveries in the rural areas with the little skills that I had acquired as part of my academic study and my assistance with the Medical officers while they were performing institutional deliveries" Udasi said in Odia.

The Road was not paved with Roses

When there was little focus on institutional delivery with no programmes like National Health Mission in place, unassisted home deliveries were quite normal. We asked about the challenges she faced during her initial phase of service in promoting safe skilled deliveries in rural villages, especially among the Juang communities of Keonjhar district – one of the 13 Particularly Vulnerable Tribal Group (PVTG) communities in Odisha, she becomes bit emotional. Difficult and hilly terrains, dense forests, the absence of any reliable communication system & transport facilities, no dedicated programmes like National Health Mission (NHM) in place, poor community awareness and negative cultural practices, poor community engagement, zero financial incentives to mothers like Janani Surskhya Yojana, absence of any cadre of health personnel at community level like ASHAs and almost a centralized and sparsely spread health institutions were some of the difficulties she narrated.

During this phase of chaos, Udasi dared utilizing her skills at delivery in conducting home deliveries as a skilled birth attendant. In forest fringe villages where institutional delivery was a distant dream, Sahu managed to take hospital care to the doorstep. She provided health care to the tribal communities by walking miles through forest in heat, dust and rain. It's not just the element Udasi had to break; the threat goes by left wing extremists as well. Apart from all these difficulties, she also admits that there are times when she does not get salaries for months together. Being an ANM doesn't come easy with little pay when there are needs of money to run the family. Amidst all these hurdles, the support of her husband & family members keeps her desire to work for the underprivileged alive.

The will that wins

Despite innumerable difficulties and challenges in reaching out to the under-served and cut off communities in tribal pockets, the unflinching passion of Udasi to work for the women and children has fetched her many accolades. From Mandal Sub-centre in Bolangir district to Landhil Sub-centre of Bansplal area in Keonjhar block, where the PVTG Juang tribes live in significant numbers to the present place of posting-Childa sub-centre in Patna CHC of Keonjhar, the caring and skilled hands of Udasi has conducted nearly 30000 deliveries without a single lapse or failure and saved about equal number of lives of both the mother and new-born.

Udasi prepares her plans meticulously by visiting every hamlet and households of the Juang communities in her sub-centre regularly. She takes note of each mother expected to deliver, prepares a delivery calendar in advance, provides all pre-delivery services at household levels, intensely engages with the family members in communicating health

messages and raising their awareness on pregnancy and delivery care and almost all the deliveries in her areas are attended by her, thus saving the lives of hundreds of mothers and new-borns. With Udasi's intervention, no maternal death was reported in the five years in Gonasika area where she served between 2001 and 2006. After witnessing these positive effects, the tribal communities also reciprocated by starting to seek critical health services from Udasi and willingly reaching out to health institutions in the locality.

Posted in Childa Health Sub Centre under Turumunga primary Health Centre (PHC) in Keonjhar district's Patna block, Udasi is skilled in treating pregnant women. Pregnant women come to her from more than 50 nearby villages for delivery, as they have a strong faith in her. She conducts 50-60 deliveries in a month. She also carries out deliveries of risky pregnancy and succeeds. This has not only reduced infant death rate in the area but also has become an example for others.

The Recognitions

Udasi Sahu-a well-known face in the district, not even once has she thought of leaving her job or village due to harsh circumstances. Spanning a journey across the tribal districts of Odisha, Sahu's 20 years of relentless efforts, unflinching passion to work for the women folk and children has landed her the prestigious National Florence Nightingale Award 2012 from Honourable President of India. National Florence Nightingale Nurses Awards are given as a mark of highest recognition for the meritorious services of the nurses and nursing profession in the country. Before this, she had received many awards and appreciation.

The hard work and dedication of people like Udasi Sahu at the grass root level, that gives us hope and reason to believe that several important government programmes like NHM is still very much achievable.

Instructions for Authors

About the Journal and its scope

Indian Journal of Community and Family Medicine (IJCFM) envisaged during the Community and Family Medicine Conclave held in the National Institute of Health & Family Welfare, New Delhi in December 2013. Approved by the Ministry of Health & Family Welfare, Government of India, it reflects the commitment to promote research and improve health care.

Objectives of the journal

1. To promulgate high quality research carried out in the institutes of national importance.
2. To provide a platform for disseminating information, ideas and innovative developments in the field of Family Medicine and Community Medicine.
3. To serve as an important and reliable source of information for the health professionals, decision makers as well as the general population.
4. To build a strong scientific base for both clinical and public health practices and policies.

IJCFM will to cater to the needs of

1. Medical Officers at various levels of health care institutions
2. Faculty members of medical colleges
3. Policy makers at state and national level
4. Functionaries of the National Health Mission
5. Consultants in hospitals and institutions
6. Researchers in academic and other institutions
7. Junior and Senior Residents
8. Non-governmental and international organizations
9. Private practitioners
10. Medical Students

The journal will endeavour to encompass all fields of community medicine and family medicine. It will include original research relevant to the practice of medicine at primary care level and public health. There will be case reports that will be relevant to medical officers in general practice. It will also cover the latest diagnostic and treatment guidelines for communicable and non-communicable diseases. The section on health policy initiatives can be a forum for disseminating programmatic policies. It will include interviews with doyens of community and family medicine for them to share their vision for healthy nations. It will also strive to share the success stories from various parts of the country and the world, which will serve as inspiration for the readers. The aim will be to range from empowering medical officers at a primary health centre to enrich and inspire the accomplished researchers in academic institutions.

Types of articles

1. Editorial (by invitation)
2. Review articles
3. Original research
4. Short Communication
5. Case reports
6. Perspective
7. Current Updates
8. Continuing Medical Education
9. Book Review
10. Interviews (by invitation)
11. Health policy initiatives (by invitation)
12. Correspondence/ Letter to editor
13. News and events
14. Public Health Success stories
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Preparation of Manuscripts

Manuscripts must be prepared in accordance with "Uniform requirements for Manuscripts submitted to Biomedical Journals" developed by the International Committee of Medical Journal Editors (October 2006). Strict guidelines regarding authorship criteria and ethics should be followed.

There should be uniformity of format with equal 2.54 cm margins on all the sides. First lines of the paragraphs should **not** be indented. Font should be Times New Roman, size 12, pages should be justified, double spaced with page numbers on the bottom right corner. Each section should start in a new page. Manuscript should be written in British English.

Cover page: This should contain the title, running title, category of article, authors names and affiliations (not degrees), institution name and address, key words, number of words in abstract and main text, number of tables and figures, source of fund and conflict of interest.

Abstract: for research communication, should be of 250 words and structured as Background, Methods, Results & Conclusion. However it may not be structured in review article, CME, perspectives or health policy initiatives.

Introduction: should be short, specific, relevant and justify the study objectives.

Methods: should talk about all components of research including study design, study participants, study tools and statistics. There should be clear mention of the institutional ethics board approval and informed consent form. For clinical trials, registration number, and where the trial is registered should be mentioned.

Result: Text should not repeat the information in the tables and figures. Figures and tables should be serially numbered, separately in Arabic numbers. It should be in logical sequence and should not consist of inferences.

Discussion: should be in relation to the findings of the study, in view of prevailing situations/conditions or results of other researchers. Results should not be repeated here. Recommendations should be included along with limitations of the study in this section.

Conclusion: should be based on the study findings and comprise of salient points.

References: Listing of references should be in Vancouver style. After six authors, et al should be used. Citation within the text should be in superscript at the end of the sentence. Unpublished work should not be used for reference. Do **not** type the numbers but use bullets for numbering the references. Webpage citations should be accompanied by URL and citation date in parenthesis.

Tables and figures: Tables & figures should be made in Excel and then pasted into word. They should feature after references. Each should be in a new page. Figures should not be in colour. There should be a maximum of three tables and three figures.

Photographs: can be black and white or coloured in jpg/jpeg and TIF/TIFF formats

Word Limits

Original article (Maximum 4000 words)

Review articles: should be structured with relevant headings, which should include background and conclusion. (Maximum 3000 words)

Short Communication (Maximum 2000 words)

Updates & Perspectives (Maximum 1500 words): This will encompass the recent clinical guidelines, updates in the national programmes, opinions and viewpoints toward important clinical, health programmes, educational, policy issues.

Case report (Maximum 1000): They should be reflective of the types of cases seen by a general practitioner or a family physician.

Continuing Medical Education: 2000 words

Book Review/Public Health Success stories/Resident or student corner (Maximum 1000)

Clinical Trial registration

All clinical trials should have been registered in the relevant Clinical Trial Registry to be accepted for publication. Clinical Trial number and date of registration should be clearly mentioned. An unregistered or retrospectively registered trial will not be considered for publication.

Units

Système international units should be used throughout the text.

Drugs

Whenever drugs are mentioned, generic names should be used except when proprietary brands are used. In latter case, first the generic name should be used with manufacturer's name in parenthesis, then the trade name can be used in rest of the manuscript.

Abbreviations

Only well known and accepted abbreviations may be used in the manuscript. Whenever an abbreviation is used for the first time, it should be written in full with abbreviation in parenthesis. Thereafter it can be written as such in rest of the text.

Conflict of interest

Any conflict of interest should be clearly mentioned; whether it be personal, professional or funds are involved.

Funding

Source of funding should be clearly mentioned

Plagiarism

Every manuscript submitted will undergo plagiarism check and if found to be plagiarized, will be either rejected or returned to the authors for amendment, depending upon the quality of the work and the extent of plagiarism.

Authorship

Only those individuals who qualify for authorship should be included in the authors list. They should have made substantial contribution to the article and there should be no gift authorship.

Acknowledgement

Acknowledgment should be given at the end of the manuscript before the references. Those individuals who helped in the research but do not qualify for authorship should be thanked in this section.

Not published previously/submitted elsewhere

The manuscripts will be received, subjected to editorial & peer reviews and accepted for publication on the premise that it has not been published previously nor is it submitted elsewhere for publication.

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Forthcoming Events

01 Workshop on Capacity Building for Medical College Faculties in Data Analysis using EPI Info will be held from 28th August to 1st September 2018 at Sewagram, Wardha.

02 Symposium on Complexity in Health & Wellness.05 Sep 2018 - 07 Sep 2018 at Burlington, United States. Details can be accessed http://vermontcomplexsystems.org/events/health-and-wellness/

03 International Conference on Health and Air Pollution: Effect and Management (ICOHAP-EM-2018) will be held from 7th to 8th September, 2018 at New delhi. Details can be accessed from http://www.idcconferences.org

04 Regional Conference on Occupational Health, 2018. Kuala Lumpur, Malaysia. On13th-15th September2018. Website: https://soem-mma.org.my/

05 8th International conference on Epidemiology & Public Health, September 17-19, 2018, Rome, Italy.

06 22nd WONCA World Conference of Family Doctors (WONCA 2018) at Seoul, South Korea on 17 Oct 2018 - 21 Oct 2018. Details can be accessed http://wonca2018.com

07 14th International Conference of Telemedicine Society of India (Telemedicon 2018) will be held from 1st November 2018 to 3rd November 2018 at Amravati, Andhra Pradesh.

08 Golden Jubilee Conference of Nutrition Society of India (50th Annual Conference of NSI) is scheduled to be held from 15 – 17 November, 2018 at National Institute of Nutrition, Tarnaka, Hyderabad.

09 10th National Conference on Health Profession's Education 2018- 15th-17th November 2018 at NKP Salve Institute of Medical Sciences & Research Centre & LMH, Nagpur. website - www.nchpe18.in

10 Adolescent conference will be held from 24th to 25th November, 2018 at New Delhi. Details can be accessed from www.adolescon2018.com

11 15th International Conference on Urban Health. 26 - 30 November 2018 | Kampala, Uganda. Details can be accessed from http://www.isuhconference.org/

12 4th National Workshop cum CME on health System strengthening is scheduled from 17th to 21st December, 2018 at PGIMER, Chandigarh.

13 63rd Annual National Conference of Indian Public Health Association will be held from 31st January to 3rd February, 2019 at Kakinada, Andhra Pradesh. Details can be accessed from iphacon2019@gmail.com

14 17th Annual International Society for Disease Surveillance Conference at San Diego, California, United States on 29 Jan 2019 - 01 Feb 2019. The details can be accessed from https://www.healthsurveillance.org/page/conference

15 1st International & 46th National Conference of Indian Association of Preventive & Social Medicine will be held from 8th to 10th March, 2019 at Shimla. Details can be accessed from iapsmcon2019@gmail.com

Institutions/ Organisations are requested to send the information about forthcoming events (conferences, workshop, seminars, etc.) to the Editor in Chief, IJCFM at ijcfm2015@gmail.com. These will be published in subsequent issues for wider dissemination

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