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Editorial

Convergence between Health and Medical Education

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The Health and Family Welfare has three arms - Health, Medical Services and Medical Education. The administration is divided between Secretary, Health and Secretary, Public Health. Departments of Health and Medical Services function in separate compartments than Medical Education. Functionally, it makes sense if these departments can complement each other for mutual benefit. This calls for some convergence of the administrative structures between the departments of Health, Medical Education and Public health, which exists in our state in the form of Commissionerate of Health, along with other related government departments and programmes.

Currently, the clinical exposure of students of medicine is almost entirely in teaching hospitals. They do not have adequate exposure to health care delivery at the primary / secondary level, which the district health care system can offer. Professionals in the district system do not have opportunities for advancement of knowledge for improving their services. The linkage between the medical colleges and the health system would be beneficial to both, as well as a platform for problem solving. Thus, without incurring much additional expenditure, both, the colleges and the district health care machinery can perform their roles better than at present.

Current status of integration with health system in Gujarat:

Medical Colleges in Gujarat especially the government run colleges have a level of integration with health and medical system which is better than many of the states. Entire faculty of medical colleges especially those from PSM, Paediatrics, Obstetrics and Gynaecology, Anaesthesia and Medicine are involved in this task in many ways such as

1. Training: Medical Education through its faculties is involved in various trainings under different health programs.

    a. Reproductive & Child Health (RCH) – maternal health, family planning, immunization STI/RTI, ARSH.

    b. National Vector Borne Disease Control programme (NVBCD) – Malaria, Dengue, Leptospirosis, CCHF and other diseases

    c. National AIDS Control Programme (NACP) – various components under HIV/ AIDS control including blood safety.

    d. Non Communicable Diseases trainings for MOs in selected districts

    e. Trainings of (Emergency Obstetric care (EMOC), Early New Born Care (ENBC), Navjat Shishu Suraksha Karyakram (NSSK) to Medical Officers (of 3 – 6 months duration)

    f. Integrated management of neonatal and childhood illnesses (IMNCI) and F-IMNCI

2. Service

    a. Patient care – primary and referral including school health

    b. Providing professionals for FP camps for Tubal Ligation, Non Scalpel vasectomy

c. Epidemic - investigation
d. Certification of handicapped persons
e. Integrated Disease Surveillance Programme

3. **Monitoring and Evaluation** : Faculty and residents are routinely involved in Monitoring and Evaluation of many national health programmes
   a. Process
      i. School Health
      ii. Pulse Polio Immunization and Bi annual round Vit A supplementation
      iii. Pulse Measles vaccination (catch up round)
      iv. State Routine immunization Monitoring
   b. Performance/ outcome
      i. Multi Indicator Cluster Survey (MICS) for RCH services
      ii. Mass Drug Administration (MDA) for Filariasis
      iii. Supportive Supervision Team visits for STI clinics under NACP
      iv. Nutritional programmes: Iodine Deficiency Disorders and Integrated Child Development Scheme

4. **Research:**
   a. Medical colleges undertake research both in basic and applied areas either as thesis or otherwise in various sectors and the findings are shared with concerned departments.

b. Directorate of Medical Education provides funding support for research.
c. RNTCP and NVBDCP fund research in their areas which is availed by postgraduates for theses.

Scope of Convergence:

However, there is a scope for exploring many more areas where the integration is possible and indeed desirable.

a) **Capacity Building** : Training in colleges should prioritise local health problems, focusing on evidence based medical care and as per the guidelines of national programmes. Treatment guidelines of national programmes should be taught AND followed in medical colleges. Apart from that protocols can be developed and taught for other local health problems. This can be done by clinicians along with public health colleagues keeping in mind the existing realities.

b) **Operational Research** : Areas of research, specially the operational type, should be suggested by health authorities' based on their needs, as is being practised under RNTCP. There can be development of a funding mechanism under District Health Society (DHS) which can fund research in areas of their interest.

c) **Mutual support :** The faculty of medical colleges can play a very useful role in the preparation of the PIPs.

Similarly, programme managers and district health staff can be valuable guest faculty for the Community Medicine students. The Medical Council of India (MCI) guidelines on undergraduate curriculum includes teaching undergraduates the fundamentals of

health management at PHC level, (which are equally relevant for private practice) but is seldom taught. This is where our colleagues of health department could help.

d) **Community Oriented Teaching and Learning** :

RHTCs and UHTCs also provide great opportunities for not only giving the undergraduates community exposure but also to interns to practice what they have learnt. Interns have shown a lot of enthusiasm in participating in community activities especially those which give a scope to exhibit their creative talents like street plays. RHTCs also provide opportunities for postgraduates for learning skills such as qualitative research, participatory research and communication skills. It can be made more meaningful by involving colleagues of other departments, including departments involved in diagnostics to identify ways and means of improving healthcare to the poor.

Changing the mindsets :

It has been argued that integration would mean doing the job of health department personnel, but I ask myself how justified am I in calling myself an expert, for example, on a health programme just because I have read a module/document before others? One needs both, the insight based on our training as well as field experience to develop real expertise. The experience of in-service doctors who go back to the field after a degree or diploma bears testimony to this. There is also the question which all of us need to deliberate- is MD Community Medicine/PSM curriculum sufficient or should we also be looking at

the need to include a portion on Public Health Administration (PHA). The current teaching in degree courses does not address aspects related to administration, finance to name a few, which are very much a part of PHA.

On the other hand, there is diffidence on the part of health department to employ qualified public health specialists. Probably, it arises from the fact that they believe the postgraduates of Community Medicine lack the practical skills/field experience. While, we maintain our lofty stand that our MD degrees cover everything. The earlier practice of sending health department officers to obtain a Diploma in Public Health recognized the need for training them in the theoretical aspects of public health. This is precisely the reason why we must have integration, to develop a symbiotic relationship and not an adversarial one, one that is of mutual respect rather than disdain.

Conclusion:

The Government of India is exploring how such integration can be achieved by initiating a pilot project in 5 states including Gujarat. It is being carried out by Centre for Innovations in Public Service (CIPS), Hyderabad.

I have not dwelt on such integration in urban areas, as not only most of the things remain true for them also but are easier in terms of feasibility. Urban health is an area which has been for long underserved and is now coming into focus under National Health Mission. It also offers a lot of scope to work, learn, innovate and contribute to public health programmes.

At the end of the day, both departments are stakeholders in the health of the people and thus the onus is on both to make a commitment that it would happen and work.

<u>**Initiative**</u>

"Problem Solving for Better Health" (PSBH): Our Experience

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The faculty members of Community Medicine often feel that exposure of the undergraduate medical students to the community outside the premises of the institute is essential for them to have the first hand information of the community needs and community problems. Even though efforts in this direction are made in the form of family study or clinico-social case study in the field or field visits to some institutions/ departments, but the interest of the UG students and expected results of these visits are far from satisfactory.

Under new regulations of Medical Council of India (MCI), research projects are made compulsory at all levels of medical education. Therefore, research methodology has become a felt need of the medical curriculum. That is how we at Community Medicine Department of Smt. NHL Municipal Medical College, Ahmedabad decided that it is appropriate to sensitize final year undergraduate medical students and make them do their research projects.

The mission of PSBH is to develop innovative, small scale, and simple Problem Solving projects that will benefit many people. Participants generate new ideas and Methods to utilize the resources more effectively. The goal is to stimulate participants problem based projects based on individual responsibility and action to create collaborative network of small, self sustaining and lasting Health projects

In the year 2000, Health Action by People (HAP) (which is a non governmental organization based in Kerala and also is the Indian partner of Dreyfus Health Foundation, New York), approached our institute to implement PSBH programme to undergraduate students.

Dr. A.R.N. Setalvad, then Dean of our institute whole heartedly encouraged this innovative activity and invited faculty of HAP to conduct the PSBH workshop. Then Professor and Head of the Department of Community Medicine, Dr. K. N. Trivedi in our medical college took the initiative to organize the workshop in our department for the first time on 7th & 8th August 2001 and this legacy continues. Four faculty members of HAP were invited as the external facilitators to conduct the workshop for our UG students. All the teachers of our department, three faculty of Medical Education Unit and two Professors (Dr.Geeta Kedia & Dr.Sudha Yadav) of Community Medicine department of B.J.Medical College, Ahmedabad participated as internal facilitators along with one external facilitator in each group of undergraduate students. Initially HAP had supported the workshop in several ways and subsequently, the department/ institute has taken over. The faculty of HAP had invited our departmental faculty to join them as external facilitators and we were able train UG students of 15 medical colleges.

The PSBH Philosophy of HAP:

PSBH believes that solutions to most health problems are well within our reach. The solutions to must be ingenious and simple. The emphasis is on problem solving in order to make a difference, even if the numbers of beneficiaries are small. The students are encouraged to generate much needed information through analysis of hospital data or laboratory data or through cross sectional surveys or case control studies.

The goal of the programme was to expose the undergraduate medical students to a new experience through participatory learning and the ultimate goal was getting

the research done by the students under the guidance of the teachers of Community Medicine. Modern medical education trains young doctors to treat sickness on an individual basis. Interventional technology and sophisticate diagnosis take precedence over concerns about social, psychological and environmental origins of illness. Little stress is given to non medical interventions in reducing the burden of illness. Today's policy planners and policy makers are relying on the advice of doctors particularly experts in Community Medicine and Public Health. To meet these changing needs, the medical doctors are required to come together and evolve simple, innovative and cost effective local solutions to most of the health problems. Commitment and innovation are two critical elements in problem solving.

There is a dearth of reliable data in our hospitals and other institutes gathered on our patients and if there is any data, the validity of that data is also questionable because it is not collected with scientific vigour. The results in inappropriate policy formulations and misguided interventional strategies. Therefore, the young medical students have to be sensitized on the importance of gathering reliable evidence and using such evidence for appropriate action.

PSBH for undergraduate medical students:

The mission of PSBH is to sensitize medical students on important health problems of local relevance and to equip them with innovative skills for problem solving. The PSBH process enables the students to develop skills for innovative approaches to solve health problems. The participants are encouraged to identify common health problems, or social problems that need urgent action and evolve innovative approaches to solve them. Every student is encouraged to participate in group discussion on the health / social problem topic selected. Each one contributes ideas and knowledge

to the benefit of others and each one also learns from the insights of other participants. The whole process is guided by the facilitator (teacher) through various stages of problem solving. The exercise starts with identification of a health problem and culminates in each participant developing an action plan to solve the problem. After the two days workshop, every participant is expected to implement his/ her solution, as a group of three or four students. These community based projects are expected to bring better health people in the community.

The PSBH process:

The Problem Solving for Better Health is a continuum of many activities. It starts with identification of a problem and proceeds through various stages to the successful implementation of the solution. This exercise by medical students is an initiation into research methodology in medicine. The experience is shared with others students by audio-visual presentation and report writing and sometimes by publishing the article. The students learn the skills mentioned below.

- Identify a problem and Refine the problem
- Frame the Research question (SMART question)
- Develop proper action plan or Develop a Protocol
- Implement the action plan
- Analyze and interpret the data to assess the success or failure
- Write the final research project report
- Present the results of the project and
- Share the experience with peers, teachers and community

PSBH Workshop in our Institute:

Since August 2001, every year two workshops are held for UG students (one for regular batch and other for repeater batch). It was decided to start the activity in the beginning of VI Semester and complete it before the end of VII Semester. Thus the students get duration of 8 months to complete the research project under the guidance of their teachers (facilitators) and

prepare the report. Then, a Re-Union workshop is held and each project would be shared by power point presentations with everyone in their class and all the teachers. Each faculty of the department would take up 12 to 14 students. A group of 3 to 5 students would take up one research question and work as a team. The facilitators guide them throughout with minute details at every stage. We have some weightage for this research project in the Internal Practical Marks in the subject. Thus this is made mandatory for each UG student to participate in this activity. Thus every year 32-35 research projects are contributed.

Outcomes of PSBH:

Academic & Technical Skills:

1) Medical students are sensitized on important health problems of local relevance

2) They are equipped with innovative skills for problem solving

3) They are exposed to the community and have close interaction with people, this makes them aware of the real day to day physical, mental, social and psychological problems of the community,

4) They learn to frame a right Research Question, write a Protocol, project writing and presentation of their research project,

5) The concepts of Epidemiology and Biostatistics in addition to the topic of research question become very clear to the student

6) They learn computer skills, e.g. data entry, data analysis using software like EPI-6 and EPI-2000 or SPSS for the analysis, display of data, etc.

7) They learn to do Literature search by adopting various measures, on computer, books, journals, discussion with teachers and seniors, etc.

8) They learn to prepare power point presentation to present their project and learn the constraints of time in presentation in scientific sessions

9) The students are encouraged to publish original articles if the teacher feels that the work is of publication quality

10) Clarity of the subject, logical thinking and simple, innovative and appropriate actions the academic gains

11) They did realize the difficulties of research and how to overcome them.

Communication Skills, Public speaking skills & Team spirit:

1) They develop communication skills

2) They learn to do work in a team and understand the group dynamics

3) They develop team spirit and learn the importance of co-operation working in a group

4) The project execution involves active interaction of students with teachers and thus student teacher relationship is strengthened. This helps in day to day evaluation of the student as recommended by MCI and University. All students are encouraged t participate actively and this is monitored by the teacher and punitive action is taken if any student is inactive or irregular.

5) If the project involves interaction with other departments of institute, e.g. they learn to get the co-operation from them.

6) They learn to interact with other institutes, (other than their parent institute and hospital) and the personnel there if they do any project there; they learn to get the co-operation from them.

7) They get the experience of seeking permission at each level, building good rapport with each other, taking consent of the study subjects , respecting the confidentiality and helping the subjects solving their problems,

8) They learn the importance of working with limited resources and keep their innovative and appropriate technology interventions as simple as possible.

9) Health Education is done in every project whether Health Education intervention is done as a part of research question or not, thus the people get the benefit of increasing the awareness in all aspects of the problem they are studying in the community

10) Students develop good human qualities of perseverance, empathy, compassion towards the people and develop the attitude of helping the needy to the extent they can do.

11) They develop faith in people, try to give their best to them and promote community participation.

Original article

Trend of MDA Coverage and Compliance in the Four Endemic Districts of Jharkhand: A Secondary Data Analysis.

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Abstract

Background: Lymphatic filariasis is one of the world's leading causes of long term disability. It is not fatal, but it causes debility and imposes social and economic burden to the affected individuals, their families and society. In India, 250 districts have been identified to be endemic for filariasis. In Jharkhand 17 out of 24 districts are declared to be endemic for lymphatic filariasis. The Government of India in 2004 began a nationwide MDA campaign in all endemic districts with an annual dose of DEC with aim of eliminating it as a public health problem by the year 2015. The strategy is to cover more than 85% of the population with the drug continuously for at least five years to eliminate lymphatic filariasis.

Objectives: (1) To know the trend of coverage of MDA in selected districts of Jharkhand in last three years. (2) To assess the compliance rate. (3) To know the reasons for poor compliance, if any. **Methods**: A record based study was done in November 2012, on "Evaluation of MDA for ELF in Jharkhand" conducted by PSM Dept. RIMS Ranchi, with support from NVBDCP. 4 out of 17 endemic districts of Jharkhand i.e. Ranchi (including Khunti), Hazaribagh (including Ramgarh), Gumla and Sahibganj were selected for secondary data analysis.

Statistical analysis: District wise comparative tables showing coverage and compliance percentage were generated in MS excel.

Results: The MDA coverage and compliance rate are not satisfactory and a matter of great concern as it may not help in achieving MDG. **Conclusion**: IEC activities should be strengthened further. There are logistic, human resources and behavioural issues which need to be addressed in order to optimize compliance.

Keywords: MDA, ELF, Coverage, Compliance.

Introduction:

Lymphatic filariasis (LF), an ancient parasitic disease, is responsible for untold human suffering.[1] India contributes about 40% of the total global burden and accounts for about 50% of the people at the risk of infection.[2] In pursuance to WHO call for elimination of lymphatic filariasis, Government of India in 2004 began a nationwide mass drug administration (MDA) campaign in all endemic districts with an aim of eliminating it as a public health problem by the year 2015.[1] Under mass drug administration (MDA) campaign, on a particular day a single dose of Diethylcarbamazine (DEC) 600mg and antihelminthic Albendazole (ALB) 400mg is distributed to inhabitants of all age and sex in filarial endemic areas, excluding children below 2 years of age, pregnant women and severely ill patients.[3]

One of the major challenges in the transmission interruption using MDA is that a very high coverage of 85% is required to achieve the interruption of transmission in 4-6 year time.[4] This high coverage is essential for four to six years, which is the average reproductive life span of the adult

worm.[5] Compliance with medical recommendations, especially with drug therapy, has been recognized to represent a complex challenge.[6] The effectiveness or success of LF elimination depends on the coverage and consumption (compliance) of the drug by the affected population and intermediary evaluation of the program.[7]

A total of 250 districts spread in over 20 states/UTs of India have been identified to be endemic for filariasis. Jharkhand is one of the affected states in our country. Out of 24 districts 17 are declared to be endemic for lymphatic filariasis.[8] Many areas in the state, predominantly tribal and hilly areas, lack basic health care infrastructure limiting access to health services at present.[9]

If we want to achieve our goal to eliminate lymphatic filariasis by 2015, the coverage along with compliance (actual consumption) of drug is important in the consecutive 4-6 years for elimination of lymphatic filariasis. Hence the present study was conducted to assess the trend of MDA coverage and compliance on the basis of evaluation survey done by RIMS for MDA 2009-2011.

Methodology:

The methodology focuses the study design of independent evaluation done by the Department of PSM, RIMS, Ranchi according to the guidelines of Elimination of Lymphatic Filariasis in India (2009). The Department of PSM, RIMS, Ranchi had been involved in evaluation of MDA survey since the launch of MDA campaign. This study is a secondary data analysis based on the Independent Midterm Evaluation Report of MDA carried out by the PSM Department, RIMS, with support from NVBDCP. From the evaluation report of last three years (MDA 2009, MDA 2010 and MDA 2011), four common districts namely Ranchi (including Khunti), Gumla ,Sahibganj and Hazaribagh (including Ramgarh), were selected for comparative

purpose. The present study is an attempt to evaluate the trend of coverage and compliance of MDA in subsequent three years in all the four districts.

The working definitions for drug coverage and drug compliance are as follows [10:]

Drug coverage: It is the number of eligible persons who received DEC and Albendazole together during MDA campaign. It is calculated as the total number of persons who received drug divided by eligible population and is expressed as percentage.

Drug compliance: It is the number of persons who ingested DEC and Albendazole together in presence of drug distributor during MDA campaign. It is calculated as the total number of persons who ingested drug divided by total number of persons who received the drug and is expressed as percentage.

Study design of Independent Evaluation done by Department of PSM,RIMS – According to the guidelines of Elimination of Lymphatic Filariasis (ELF) in India (2009), to know the compliance of the drug, from each district 4 clusters (each cluster having 30 households) were selected comprising urban and rural areas. The 4 clusters comprised of three PHCs (primary health centre) from rural area and one Municipal ward from urban area which were randomly selected. According to the guidelines on ELF (2009), PHCs were classified in three categories high, medium and low on the basis of coverage reported by concerned PHC. From each category one PHC was selected at random and from each PHC or Municipality, one village/subcentre or ward was selected randomly. In this way 120 households were surveyed from each district and as such total of 480 households were selected.[10]

Results:

Report given by the Government of Jharkhand shows non uniform trend of MDA coverage in all the four districts during

2009-2011 (Table no 1). There was a significant decline in MDA coverage during

Table 1: District-wise MDA coverage (%) by Government of Jharkhand.

DISTRICTS	MDA 2009			MDA 2010			MDA 2011		
	Eligible population	No. of persons received drug	Coverage (%)	Eligible population	No. of persons received drug	Coverage (%)	Eligible population	No. of persons received drug	Coverage (%)
Ranchi (including Khunti)	3017113	2601495	86.22%	3086508	2176013	70.5%	3157497	1312296	41.56%
Gumla	836609	797390	95.31%	855851	852900	99.66%	921614	880470	95.54%
Sahibganj	981257	649668	66.21%	1003826	723652	72.09%	1026913	890893	86.75%
Hazaribagh (including Ramgarh)	2407281	2088912	86.77%	2462648	2115517	85.90%	2519288	2135995	84.78%
Total	7242260	6137465	84.74%	7408833	5868082	79.20%	7625312	5219654	68.45%

specified period in Ranchi (including Khunti) district as 86.22% and 41.56% in 2009, 2010 and 2011 respectively. Decline of MDA coverage was marginal in Hazaribagh (including Ramgarh) as 86.77%, 85.90% and 84.78% respectively during the same period. MDA coverage in Gumla district shows a fluctuating trend although more than 95% coverage was maintained in all the three years 95.31%, 99.66% and 95.54%. As per Jharkhand government report, Sahibganj was the only district among these four districts where MDA coverage proportion has improved over years being 66.21%, 72.09% and 86.75% in 2009, 2010 and 2011. Overall there was a decline in MDA coverage in these four districts being 84.74% in 2009, 72.20% in 2010 and 68.45% in 2011 (Table no.1). There was no clarity about compliance rate in Jharkhand Government data.

Midterm independent evaluation survey conducted by PSM department of RIMS addressed both coverage and compliance rate.(Table no. 2) All the four districts shows initial increase in MDA coverage rate followed by decrease in coverage rate. MDA coverage in Ranchi

(including Khunti) district was found as 58.97%, 63.04% and 33.54% in 2009, 2010 and 2011 respectively. Similar trend were seen in Gumla district (48.37%, 49.59% and 38.39%) ; Sahibganj 55.17%, 57.78%, 41.62%) and Hazaribagh (including Ramgarh) being 61.75%, 66.55% and 45.10% respectively during the same time period. Overall MDA coverage as in study conducted by PSM department shows similar trend 56.04%, 59.22% and 39.64% in 2009, 2010 and 2011 respectively (Table no.2).

However, compliance rate over specified time period shows increasing trend in all four districts (Table no 2). Compliance rate in Ranchi (including Khunti) being 24.02%,26.47% and 33.54%; Gumla 18.85%, 29.54% and 55.74%; Sahibganj 28.57%, 30.97% and 56.64%; Hazaribagh (including Ramgarh) being 12.86%, 17.89% and 59.59% during 2009, 2010 and 2011 respectively. Overall MDA compliance percentage during same time period in all four districts shows increasing trend seen as 20.96%, 25.79% and 55.59% during same period (Table no 2).

Table 2: Evaluation of MDA coverage (%) and compliance (%) (RIMS, RANCHI.)

DISTRICTS	MDA 2009			MDA 2010			MDA 2011		
	Eligible popu-lation	No. of persons received drug (Coverage %)	Compliance %	Eligible popu-lation	No. of persons received drug (Coverage %)	Compliance (%)	Eligible popu-lation	No.of persons received drug (Coverage %)	Compliance (%)
Ranchi (including Khunti)	607	358 (58.97%)	86 (24.02%)	617	389 (63.04%)	103 (26.47%)	632	212 (33.54%)	103 (48.58%)
Gumla	614	297 (48.37%)	56 (18.85%)	621	308 (49.59%)	91(29.54 %)	612	235 (38.39%)	131 (55.74%)
Sahibganj	609	336 (55.17%)	96 (28.57%)	604	349 (57.78%)	108 (30.97%)	615	256 (41.62%)	145 (56.64%)
Hazaribagh (including Ramgarh)	604	373 (61.75%)	48 (12.86%)	613	408 (66.55%)	73(17.89 %)	623	281 (45.10%)	168 (59.78%)
Total	2434	1364 (56.04%)	286 (20.96%)	2455	1454 (59.22%)	375 (25.79%)	2482	984 (39.64%)	547 (55.59%)

Discussion:

The effectiveness or success of LF elimination depends on the consumption (compliance) of the drug by the affected population and intermediary evaluation of the program. Thus compliance should be considered as the major criterion during MDA campaign along with drug distributed, for which it is necessary to accentuate "on the spot" drug consumption[7]

The present study showed that there is a marked difference between the data shown by the Government and the independent evaluation done by the Dept. of PSM regarding drug coverage in the four districts during three years. As per the report of Independent Evaluation done by PSM Department some of the barriers for poor compliance of drug were reluctant to swallow drug and being not acquainted with the programme. People had a general perception that when long duration treatment for LF could not cure the patients how could a single course therapy would be effective. Some of them were reluctant to swallow drug empty stomach. There was no scientific knowledge about the disease among population due to ineffective IEC activities. Although officers claim of miking and door to door campaigning, but no banners, posters and wall writing could be seen in the field. [10]

Most of the people were not available at home during the morning hours, so the drug distributors handed over the tablets to any member of the family for the whole family thereby reducing the compliance. Thus there is a definite need to ensure that the drug distributor meets the person for which he may visit the home in the evening for the missed persons of the family. Some other barriers were like no return mechanism of unused DEC+ ALB tablets after the completion of the campaign and these were lying with the districts to periphery and other agencies. Drug distributor training had not been organised in any district/PHCs. They only got a sensitization briefing about the activities

during monthly meeting. Some of the Medical Officer in charge expressed their views that they did not get adequate fund for remuneration to the drug distributor. A large number of persons could not recollect distribution of tablets as the MDA evaluation survey was carried out six months later (recall bias). Independent evaluation needs to be done within six months after the completion of the programme to avoid recall bias. Recruitment of more field staff is needed for door to door visits to have effective coverage and on spot drug administration.[10]

It has been noticed that though the compliance rate was low in all the three years, there is a rise in trend of compliance rate from 20.96% (2009), 25.79% (2010) to 55.59% (2011).Though the compliance rate has increased but still coverage in all the four districts could not be achieved >85% which is an essential criteria to eliminate lymphatic filariasis. The limitation of this study is that as it is record based study, the reasons for increase in compliance rate even though with decrease coverage could not be ascertained. This area needs to be explored further.

Conclusion:

There is a marked difference in the MDA coverage data given by the Government and that surveyed by RIMS. MDA coverage as surveyed by RIMS in all four districts still lags behind at least 85% coverage. The compliance in all the four districts is also not satisfactory. The study highlights the need for identifying factors responsible for low coverage and compliance of the drug among the people of Jharkhand. Compliance rate of DEC+ALB is a matter of great concern and needs immediate attention or else it may not have any impact on the disease burden and elimination of lymphatic filariasis will be a far cry in the state of Jharkhand.

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<u>Original article</u>

Assessment of quality of MCH care services and client satisfaction for these services provided under Primary Health Care in Rajkot district, Gujarat, India.

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<u>Abstract</u>

Objective: To assess the quality and level of client satisfaction of the maternal and child health services provided under Primary health care.

Setting and design: Cross sectional, pretested questionnaire, interview based study.

Methodology: In Rajkot district there are total 7 blocks and 43 PHCs. In present study; 14 PHCs were randomly selected; 2 from each block. Study was conducted during Aug 2010 to May 2011. Total 400 beneficiaries of MCH health care services were selected.100pregnant mothers, 100 post natal women and 200 mothers of under-five children were selected &interviewed. Each of the services was quantified by giving score to different indicators and sub indicators. Quality was assessed based on the obtained score out of total possible score.

Results: Out of total interviewed clients; 88.54% PNC client, 77.01% ANC client and 58.32% clients of Child health service rated services as "Very good". Overall quality for ANC & child health related services fell into "Average" grade, while PNC services got "good" grade.

Conclusion: For all studied services;98% clients expressed satisfaction, however quality of the ANC and child related services were found of "average" quality.

Key words: Quality, MCH services, Client satisfaction, Rajkot district, Primary health care

<u>Introduction:</u>

Mother and child health care (MCH), refers to preventive, curative, and rehabilitative health care of mothers and children[1], is an important determinant of a nations' overall health condition. The populations covered under MCH care are women of reproductive age group and children in the age group of 0-6 years[2].These groups are large user group of MCH services[1]. A range of maternal and child health care services are provided under primary health care. A good coverage of Maternal & Child Heath Care services can have greater impact on morbidities and mortalities. It was observed that mortality and morbidity were decreased significantly since last two to three decades because of good coverage. It was suggested that additional decrease is not possible by merely increasing the quantity of services. Further reduction can be brought by improving the quality of services[3].

Consensus on the importance of quality of care in population program emerged in the International Conference on Population and Development (ICPD) held in Cairo in 1994. Provision of package of quality reproductive health services and addressing unmet health care needs of couples and individuals became the central theme[4.]

Client's satisfaction is the first indicator for quality of the service[5]. It is defined as a patient's personal evaluation of health care services & providers. It is a vital component of health care outcome and remains an area of interest and need in health care.

In respect to assessing degree of quality of health care; assessment to corresponding specified standards needs to be done. Those standards if applied are generally expected to lead to desired results. Since 2005 thrust on improving & assuring quality in PHCs is given. For the same; in Gujarat a separate cadre of Quality Assurance Medical Officer Post is created[6].

However, very limited number of studies had been carried out to evaluate quality of health care services in Gujarat and none in Rajkot. So, it was decided to assess the quality of maternal and child health services provided under primary health care in Rajkot district, Gujarat state, India.

Material and Methods

This was a cross sectional study. Sample size of 400 beneficiaries was calculated based on the assumption of 50% client satisfaction rate and 10% allowable error with formula $4pq/l^2$. Half of the sample size was divided for maternal services and half for child related services. Sample for maternal services were further divided for100 ANC and 100 PNC services.

The eligibility criteria for ANC was that the mother should have been enrolled in ANC register and should have availed service in last one month, where as for PNC was that the mother should have been delivered in last one month and for child was that s/he should have availed services in last three months. The study was done by multi-stage sampling method. Rajkot district comprises of 7 blocks and total 43 PHCs. In the first stage, 2 PHCs were selected randomly from each block, thus total 14 PHCs were identified. In the second stage 8 ANC women, 8 PNC mothers and 15 children from each 14 PHCs were randomly selectedfrom respective registers (ANC, PNC and Treatment registers). Then clients were visited at their home for personal interview.

A structured pre tested preformed closed ended questionnaire was used. Client satisfaction was assessed for services received, behavior and attitude of the staff as well as response to their queries. The degree of quality of service for antenatal, postnatal and child care was evaluated by assessing the service rendered against expected service delivery under RCH program [2]. Total seven areas in ANC and five in PNC for client were identified for quality assessment. For child health care services the check list was prepared as per IMNCI [7]. Each of the identified indicators was further described by sub indicators. Each sub indicator was given the score out of 5 depending on its essentiality. For each of the service maximum score was calculated by summation of score of each sub indicator. Achieved score of particular indicator was calculated in percentage out of total possible score graded for the quality: "Very good" for achieving $\geq 81\%$ score, "Good" for 61 to 80%, "Average" for 41 to 60%, "Poor" for 21 to 40% and "Very poor" for $\leq 20\%$ score.

Observations

Table 1: Overall satisfaction perceived by clients for MCH services.

Sr. no	Service	Level of satisfaction (Perceived by the individual)				
		Very good	Good	Average	Poor	Very poor
1.	ANC service N=109	77.0 %	22.9 %	0.00%	0.00 %	0.00 %
2.	PNC service N=96	88.5 %	11.4 %	0.00%	0.00 %	0.00 %
3.	Child health service N=206)	58.7 %	39.3 %	1.9%	0.00 %	0.00 %

Table 2: Quality assessment of ANC services

Sr. No.	ANC service indicator	% delivered	Average of Combined scoring*	Level of Quality
1	Registration of Pregnancy	91.6	5	Very Good
2	Detail about history taken	57.7	3	Average
3	Physical Examination done	85.2	5	Very Good
4	Services provided	78.2	4	Good
5	Advices given	51.6	3	Average
6	Counseling done	17.5	1	Very Poor
7	Knowledge regarding JSY/CY scheme	12.0	1	Very poor
Overall Average combined scoring * based on weightage and % delivered for individual indicator			3	Average

Table 3: Quality assessment of PNC services

Sr. No.	PNC service Indicators	% delivered	Average of combined scoring*	Level of Quality
1	Visit of health provider within 48hrs	96.8	5	Very Good
2	Inquiry for complain done	58.1	3	Average
3	Service provision	91.6	5	Very Good
4	Advice and counseling services	84.2	5	Very Good
5	Visit by health provider within 42 days	100	5	Very Good
Average combined scoring *based on weightage and % delivered of individual sub-indicators			4	Good

Table 4: Level of quality for examination and treatment of common child health ailments

Sr. No.	Indicators/ Sub Indicators	Percentage achieved	Scoring	Level of Quality
Examination				
1.	Cough	95.74	5	Very Good
2.	Diarrhea	36.97	2	Poor
3.	Fever	78.22	4	Good
4.	Malnutrition	32.85	2	Poor
5.	Anemia	66.00	4	Good
Average combined scoring (Based on weightage and % delivered of individual sub-indicators)			2	Poor
Treatment				
1.	Cough	73.76	4	Good
2.	Diarrhea	85.61	5	Very Good
3.	Fever	65.43	4	Good
4.	Malnutrition	51.51	3	Average
5.	Anemia	43.49	3	Average
Average combined scoring (Based on weightage and % delivered of individual sub-indicators)			3	Average

Results and Discussion

Ninety eight percent of clients had expressed their level of satisfaction for MCH services as "good" or "very good". 77.01% of pregnant women, 88.54% of post natal women and 58.73% of mothers of under-five children had perceived respective services as "Very Good", while 22.93% ANC beneficiaries, 11.4% PNC beneficiaries and 39.32% informants of child beneficiaries rated respective service as "Good". In similar study conducted in Kolkata published in the year 2003; nearly two third of the sample perceived the services to be "excellent or good", 22.5% felt it was "satisfactory" and 16.0% thought it was "poor or very poor"[8]. Another study carried out in Varanasi District showed that in Pindra block only 36.7% of the interviewed women were satisfied with the health services and in Cholapur block only 29.9% women were satisfied with the services provided in health care centres[9]. In the study "Client satisfaction on Maternal

and Child Health Services in Rural Bengal" by Palas Das et al. mentioned that 54.31% client rated MCH services as "satisfactory" and "good" by 23.56% client while "poor" or "very poor" by around 20%[10]. The higher level of satisfaction in present study might be due to the better quality of services in Gujarat.

In the current study; overall level of quality of ANC service was found "average" on assessing the service delivery by structured questionnaire as per the RCH norm. Out of total seven indicators; for ANC service, two indicators [Registration (91.67%) and physical examination (85.23%)] were found "very good", One (services provided – 78.25%) was "good", two [history taking (57.78%) and advices given (51.68%)] were "average" and two [counseling services (17.51%) and imparting information on Janani Suraksha Youjna /Chiranjeevi Yojna(12.00%)] were "very poor". Similar study conducted in sub centers of Rohatak published in 2001 showed that quality of antenatal care was excellent in 10% of sub centers and good or poor in 90% of sub centers, services particularly registration and tetanus toxoid coverage more than 95%[11]. It was apparent from the results that out of seven activities for ANC services, activities which could be verified based on documents and being monitored regularly as per the routine supervision were found of "good" or "very good" quality, but services like counseling and imparting of information, which were not documented and difficult to monitor by supervisor indirectly were not focused by the workers resulting in to "poor" quality.

Overall PNC services, was found of "good" quality. Out of the total five activities to be performed for PNC service delivery; four (two PNC visits (96.88 %), service provision (91.67 %) and advices and counseling (84.20 %)) were "very good". But active inquiry about any complaint during post partum period was "average" (58.16 %).Study done at sub centre of Rohatak found poor quality of Post Natal care in their findings[11.] The Rohtak study was carried out in the year 2001 and at that time emphasize on post partum services was not there may be the reason behind it.

Overall quality of child health services was found "average". Quality of the child health services were evaluated based on IMNCI protocol. Out of five child health services, overall quality of "examination" was "poor" while that of "treatment" component was "average". An important activity like assessing for dehydration was found in 36.97% cases only. Also only 32.85% children were examined for malnutrition. Treatment provision for cough, diarrhoea and fever were observed in more than 60% of cases. These findings were similar with the findings of the study done in Rohtak; the diarrhoea management and ARI management were excellent or good among studied sub centre[11]. But treatment part was found "average" for malnutrition and anemia in present study. Another similar study carried out in Karnataka published in 2010 showed poor quality of ARI management, particularly history taking and physical examination while classification and treatment were excellent and for diarrhea, history taking was excellent but examination and treatment were of poor quality[12.]

Conclusion

It was seen that though in present study client satisfaction was found "Good" or "Very good" but when they were assessed against the standards, ANC service quality was observed "Average", PNC service quality was "Good" and Child health care service; examination was "Poor" while treatment quality was found "Good".

Recommendations

During the supervision, it should be tried to elicit the gap in delivery of the care in each services through interaction with beneficiaries and support the health workers in performing that particular activities. Appreciation of the health worker for achieving "good and very good" level for particular task must be given on frequent basis and provision of support & motivation for "average or poorly" achieved task and services to enhance the quality.

Limitations

For the quality assessment of Maternal Child health care different component, the sample size was not calculated separately. Out of total calculated sample size, samples are divided as; 25% for ANC service, 25% for PNC service and 50% for Child health care services. This reduces the sample size and may cause sampling error.

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<u>Original article</u>

Assessment of status of internet addiction and related factors among medical students of Rajkot city.

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Abstract

Introduction: The internet is an exciting new medium that is evolving into an essential part of everyday life all over the world. It has opened a new domain in social interactivity with the promise of increasing efficiency and worldwide understanding. Though devised primarily to facilitate research, information seeking, interpersonal communication and business transactions, for some internet users it has become the central focus of their lives and a temptation that is hard to resist.

Materials and Methods: It was a cross sectional study done in PDU Government Medical College, Rajkot from April 2013 to June 2013. The study included 212 medical students of 1st, 2nd, 3rd year MBBS who were using internet daily and consented to participate. Young's Internet Addiction Test (YIAT20) was used to study the level of internet addiction.

Results : Out of 212medical students, 143 (67.5%) were males and 69 (32.5%) were females and the age range was 17 to 25 years. YIAT20 showed 1 (0.5%) had the scoring in the range of 70 – 100, 61 (28.8%) had the scoring in the range of 40 – 60 and 150 (70.7%) had the scoring 20 – 39. There was significant difference for level of internet addiction and gender, year of study, duration of internet usage and length of internet usage.

Conclusion : The level of internet addiction is high among the medical students, watch over the use of internet by parents and colleges necessary to prevent and stop emerging internet addiction.

Key words: Internet, Addiction, Young's Internet Addiction Test

Introduction

Rapid development of information technology in societal interactions and particularly the invention and advancement of internet led to major changes in human life[1]. Internet has grown extensively in its availability, connectivity and geographical distribution since 1990s[2] and the number of internet users have raised dramatically and it continues to rise. India ranks 3rd after China and United States in terms of numbers of Internet users.[3]

Interestingly, internet addiction bears many similarities to other compulsive consumer behaviors, and its study as a type of non-rational consumption behavior could be an interesting issue in consumer studies.[4] Excessive use of the internet phenomenon may affect people with negative impacts on the academic, relationship, and other aspects of many lives.[5,6]

Although there is not a standard definition for internet addiction yet.[7] The most basic symptoms can be listed as inability to restrict internet use, to continue internet use despite social or academic hazards and feeling a deep anxiety when access to internet is restricted[8]. Internet addiction comprises a heterogeneous spectrum of internet activities with a potential illness value, such as gaming, shopping, gambling, or social networking[9].

Prevalence of internet addiction range from 2% to 15% depending on the respective sociocultural context, sample and assessment criteria utilized.[10,11]

The use of the internet on school campuses and in society has increased dramatically in recent years. Whereas the academic use of the internet is primarily intended for learning and research, the internet has also become an important part of student life[7]. More and more students are addicted to internet, while spending lots of time surfing on the internet. Such indulgence damages their health, sleep, studying and family relationship.

The literature contains only a limited number of studies which investigated level of internet addiction in college students. The present study was conducted considering the above facts, with the objective to assess the level of internet addiction and factors affecting it among the medical students – the prospective physician/surgeon of P D U Govt. Medical College, Rajkot, Gujarat, India.

Materials and Methods

The present study was conducted among medical students of 1st, 2nd and 3rd year MBBS studying at P D U Govt. Medical College, Rajkot, India. All medical students were invited to participate in the study. 425 medical students were currently studying in MBBS in P D U Govt. Medical College, Rajkot. Out of 425 medical students approached, 212 students who were using internet daily and consented to participate were included in the study, so almost 50% medical students participated in the study.. The students were assured about confidentiality of information and informed consent was taken for participation following a brief about the nature and potential value of the study. Modified Prasad`s socio-economic classification was used to determine the different socio-economic classes of the study participants[12].

Despite the convenience sampling procedure employed, attempt was made to secure a sampling procedure as unbiased as possible and to have in the data as much variability of the variable "place of permanent residence" as possible. The data was collected from April 2013 to June 2013.

The questionnaire was in English and also included basic demographic data like age, sex, residential and socio-economic status. Young's Internet Addiction Test (YIAT20) was used to study the level of internet addiction. It is a 20 – item questionnaire, answered in a five – point Likert scale. It covers the degree to which their internet use affects their daily routine, social life, productivity, sleeping pattern and feelings. The responses to the questions were on a five point Likert scale, rarely=1, occasionally=2, frequently=3, often=4 and always=5. The minimum score is 20, and the maximum is 100; Higher the score, greater the level of internet addiction and the problems internet usage causes. Young suggests that a score of 20 – 39 points is an average online user who has complete control over his/her usage, A score of 40 – 69 signifies frequent problems due to internet usage, and a score of 70 – 100 means that the internet usage is causing significant problems. The reliability was subjected to Cronbach`s alpha coefficient test which gave a score of 0.889.[13]

All data were carefully cleaned and double-spot checked for accuracy. The data was then entered and analyzed in Epi Info version 3.5.1 (CDC, Atlanta) software[14]. The chi square test was applied to compare the groups.

Results

Total 212 medical students participated in the present study. Out of 212 students, 143 (67.5%) were males and 69 (32.5%) were females. The age range of medical students was 17 to 25 years. The mean age for male was 20.11 $\pm$1.87 years,

for female 19.0 ± 1.20 years and for total study population 20.04 ± 1.68 years (table 1). 40.6% students were residing at home; 56.1% were at hostel and 3.3% were having other living arrangement. As compared to females (47.8%) more males (60.1%) were residing at hostel.

Table 1: Demographic details of medical students participated in the study (n = 212)

Category	Age in years Mean ±SD	Living arrangement of participants			Total
		Home	Hostel	Other *	
Male	20.11 ± 1.87	52 (36.4)	86 (60.1)	5 (3.5)	143 (67.5)
Female	19.0 ± 1.20	34 (49.3)	33 (47.8)	2 (2.9)	69 (32.5)
Total	20.04 ± 1.68	86 (40.6)	119 (56.1)	7 (3.3)	212 (100)

* Other includes living as a paying guest, on rent, with relatives etc.

Young's Internet Addiction Test (YIAT20) showed 1 (0.5%) had the scoring in the range of 70 – 100 (internet usage causing significant problem), 61 (28.8%) had the scoring in the range of 40 – 69 (frequent problem due to the internet usage) and 150 (70.7%) had the scoring 20 – 39 (average online user).More males (35%) had problems due to internet usage compare to females (17.4%) and the chi square test showed the statistically significant difference (p = 0.0084). Compared to second year (13.6%) and third year (28.3%) students, almost half students from first year (51.1%) had the problems due to internet usage and the difference was statistically highly significant. (p = 0.0001). Almost equal proportion students from each socio – economic class had problems of internet usage; 29.3% from upper class, 29.2% from middle class and 28.6% from lower class. Those students who were residing at home (36%) had more problem than that residing

at hostel (25.2%), but the difference was not statistically significant.

Table 2: Internet addiction score of medical students for demographic variables (n = 212)

Variable	Internet addiction score (%)		Total	P value
	20 – 49 (not causing problem)	≥50 (causing problem)		
Score wise students	150 (70.8)	62 (29.2)	212	
Gender Male Female	93 (65.0) 57 (82.6)	50 (35.0) 12 (17.4)	143 69	0.01
Study year First Second Third	23 (48.9) 51 (86.4) 76 (71.7)	24 (51.1) 8 (13.6) 30 (28.3)	47 59 106	0.00
Socio-economic class Upper Middle Lower	99 (70.7) 46 (70.8) 5 (71.4)	41 (29.3) 19 (29.2) 2 (28.6)	140 65 7	NA
Living arrangement Home Hostel Other*	55 (64.0) 89 (74.8) 6 (85.7)	31 (36.0) 30 (25.2) 1 (14.3)	86 119 7	NA

* Other includes living as a paying guest, on rent, with relatives etc.

Daily duration of internet usage for non educational purpose showed that as hours for internet usage increased, problem also increased; 12.2% for < 1 hour usage, 29.4% for 1 – 2 hours and 36.5% for 2 or more hours and difference was statistically significant (p = 0.02). While daily duration for educational purpose showed almost equal problems with increasing usage time; 29.9% for < 1 hour usage, 25% for 1 – 2 hours and 25% for 2 or more hours and no significant difference (p = 0.87) was observed with duration of usage. However total daily duration of internet usage for any Table 3: Level of internet addiction with duration and length of usage (n = 212)

Variable	Internet addiction score (%)		Total	P value
	20 – 49 (not causing problem)	≥50 (causing problem)		
Score wise students	150 (70.8)	62 (29.2)	212	
Duration of non educational use of internet < 1 hour 1 – 2 hours ≥ 2 hours	36 (87.8) 53 (70.7) 61 (63.5)	5 (12.2) 22 (29.4) 35 (36.5)	41 75 96	0.02
Duration of educational use of internet < 1 hour 1 – 2 hours ≥ 2 hours	129 (70.1) 15 (75.0) 6 (75.0)	55 (29.9) 5 (25.0) 2 (25.0)	184 20 8	0.87
Total duration of use of internet < 1 hour 1 – 2 hours ≥ 2 hours	43 (84.3) 42 (71.2) 65 (63.7)	8 (15.7) 17 (28.8) 37 (36.3)	51 59 102	0.03
Length of internet usage < 6 months 6 months - < 1 year ≥ 1 year	17 (81.0) 42 (82.4) 91 (65.0)	4 (19.0) 9 (17.6) 49 (35)	21 51 140	0.04

purpose showed increasing trend of problem with increase in time spent for internet; 15.7% for < 1 hour usage, 28.8% for 1 – 2 hours and 36.3% for 2 or more hours and significant difference was observed with duration of usage (p = 0.03).Analysis of duration of internet usage to that of problem due to its usage showed that for duration of usage < 6 months 19% students had problem, for 6 months to 1 year 17.6% had problem and for one year and more than that 35% students had problem due to internet usage. The difference for length of internet usage and problem due to its usage was found significant (p = 0.04).

Discussion

In past decade use of internet has been increased dramatically. Because of availability of smart phones, access to internet is very easy, so more and more people using internet daily especially young. Internet addiction is newer concept and affecting the young generation, with this respect, the present study was directed on the prevalent internet addiction among medical students with focus on the factors affecting it. The most important finding reported in present study was that 29.2% students had either frequent or significant problems due to internet usage. The study showed that males had more problems due to internet usage as compared to females, similar finding was also observed in a studies done by Scherer K [15] and Morahan M et al[16]. The striking feature in the present study was that as compared to second and third year students, first years students were found to have more problems of internet usage. The possible assumption for that is it might be due to change in social environment of first year students which leads them to more internet usage. There was not much difference for internet addiction and socio economic class which might be due to various sources of internet availability, accessibility and affordability to students of all socio economic classes e. g. smart phone with internet connection. As compared to students residing at hostels those residing at home showed more problems due to internet usage which can be assumed due to involvements of hostel students in other recreational activities and talking with peer groups, whereas those residing at home spent more time on internet in absence of the peer group company. The present study showed that as the time spent on internet for non educational purpose and total time spent per day increased, the problems of internet addiction also increased. NalwaK et al[17] also found that

among internet addicts 33.2% and among non addicts 9.5% were using internet for more than two years. Length of usage was also higher for those who had problems with internet usage, among students using internet for one year and more than that; 35% had problems of internet usage and among those using for less than six months; 19% found to have problems of internet usage, whereas Nalwa K et al found that 61% dependents and 66.7% non dependents were using internet for more than one year which is almost equal for dependent sand non dependents.

Limitations

The study had some limitations which may affect the applicability of the findings in other situations like, the study was undertaken on a convenient sample hence bias due to non-randomization effect might have occurred; the study participants were from one medical college only and students from other scientific streams and general citizens may have different internet addiction level.

Conclusions

The present study provides insight to the prevalence of internet addiction and factors affecting it among the prospective physicians (medical students). The level of internet addiction is high among the medical students, watch over the use of internet by parents and colleges necessary to prevent and stop emerging internet addiction.

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Original Article

Detection and comparison of foetal malnutrition by CANSCORE and other methods with birth weight as a gold standard

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Abstract:
Objective: Clinical assessment of nutritional status of neonate using CANSCORE and comparison with other methods of determining fetal malnutrition.
Design: Cross sectional study.
Setting: Tertiary care hospital.
Study Subjects: 384 live born singleton neonates with known gestational age and no major congenital malformation.
Methods: Birth weight, length, mid-arm circumference and head circumference recorded in newborns. Ponderal index and mid arm to head circumference ratio was calculated. Clinical assessment of nutritional status was done on the basis of CANSCORE and compared with other methods.
Results: CANSCORE < 25 separated 67.71% of the babies as well nourished and 32.29% as malnourished. Weight for age and MAC/HC classified nearly 70% of babies as well nourished and 30% as malnourished. Also Ponderal Index classified 75.52% the babies as well nourished and 24.48% as malnourished.
Conclusion: CANSCORE may be a simple clinical index for identifying fetal Malnutrition and for prediction of neonatal morbidity associated with it, without the aid of any sophisticated equipments.
Key words: CANSCORE, Fetal malnutrition.

Introduction:

The incidence of low birth weight (LBW) babies (< 2500 g) continues to be high in India at about 30% in contrast to 5-7% in developed countries[1]. Preterm babies account for only 10% LBW babies, the rest being term fetal malnourishment[2]. It is important to recognize foetal malnourished babies because of the high incidence of neonatal morbidity and long term sequelae. The reference criteria used for defining foetal malnourishment has been very variable. Weight at birth has been the most common criterion adopted by investigators. Here too, the cut off levels used have been birth weight less than 2500 gms. These methods do not identify foetal malnutrition which indicates a clinical state that may be present at almost any birth weight (3). The concept of foetal malnourishment as defined by low birth weight for gestational age needs reappraisal since a proportion of malnourished infants will in fact have a birth weight > 2500 grams [4]. The Ponderal index (PI) and mid arm/head circumference (MAC/ HC) ratio are two other measurements of body proportionality used to identify fetal malnourishment in newborns. But each has its own drawbacks [5,6].

Since neonatal morbidity and mortality is more closely related to nutritional status of newborn at birth than to the birth weight for gestational age, a clinical assessment of nutritional status (CANSCORE)(7) was developed to differentiate malnourished from appropriately nourished babies. The present study attempts to compare the utility of CANSCORE with other commonly used measures for defining nutritional status at birth.

Material and Methods

This study was carried out on 384 neonates considering low birth weight prevalence 20% and power of study 80% with 95% CI which were selected by systematic random sampling method

delivered at government Medical College and Hospital, Nagpur.

Selection Criteria: Criteria for infants to be included in the study were as follows:

1. Live born, singleton infants with gestational age > 37 weeks.

3. Known gestational age by last menstrual period.

4. No major obvious congenital malformation.

Neonatal Anthropometry: In all neonates weight was recorded on an electronic weighing scale at birth with 2 gram accuracy. Length, mid arm and head circumferences were also recorded with non-streaching measuring tape with 0.1 cm accuracy. The initial 30 assessments were done by two observers and the interobserver reliability was observed to be excellent. All subsequent measurements were performed by a single observer.

Ponderal index (PI) [8] and mid arm/ head circumference (MAC/HC) ratios were calculated from these measurements. A PI of < 2.2 and MAC/HC ratio < 0.27 were considered as malnutrition. A birth weight of less than 2500grams was used for defining fetal malnutrition.

Clinical Assessment of Nutrition (CAN): Clinical assessment of nutritional status was done on the basis of the superficial readily detectable signs of malnutrition in the newborn as described by Metcoff[7]. A CAN score of < 25 was used to define foetal malnutrition. This score offered the best breakpoint between growth retarded and normal infants as determined by weight for age.

Project	CANSCORE			
	4	**3**	**2**	**1 point**
Hair	Thick, dense, smooth, satin-like, easy to comb	Thick, Scarce, there is little hair straight .	Hair thin, straight and put up with more hair	Sparse, straight and erect hair, the hair bundle associated with reduced pigmentation
Cheek	Plump, round face	Slightly reduced fat	Significantly reduced	Fat is almost gone, narrow face
Neck chin	Fat overlap into double or triple chin, neck cover	Slightly reduced fat chin, the neck can be seen	Fat pad thin chin, neck revealed	Chin fat disappears, the neck is clear, loose skin, wrinkle
Arm	Fullness, can not lift the skin	Arm a little thin, check on the pressure of hands, the accordion-like folds can be formed	Small arms, to form accordion-like folds	Very little fat, loose skin, accordion-like folds significantly
Back	Inter-scapular area of skin can not be picked	Little to lift the skin	Easy to lift and skin	Loose skin, easy to lift, wrinkles can form
Buttock	Fat pad thickness	Slightly reduced fat	Significantly reduced fat, hips tip, wrinkle	Fat disappears, fight wrinkles, loose skin and a very, kind of hip, such as pipe
Leg	Described with the same arm	Described with the same arm	Described with the same arm	Described with the same arm
Chest	Full, see the intercostal space	Intercostal space slightly visible	Intercostal space revealed	Intercostal space very clear, obvious loss of subcutaneous tissue
Abdomen	Fullness, thickness of subcutaneous fat	Slightly reduced fat	Abdominal wall thinning, can form the accordion-like folds	Abdominal bulging or boat-shaped abdomen, loose skin, can form the accordion-like folds

Statistical Analysis

The observations were statistically analyzed on EPI INFO version 7 with test of significance calculated by Chi square test. Sensitivity, specificity, positive and negative predictive value were also calculated as validity measures for CANSCORE wherever required.

Results

Table 1 – Summary statistics on Anthropometric parameters of study subjects (n= 384)

Anthropometric Parameters	Mean	SD	Range
Birth Weight (gm)	2657.69	$\pm$ 392.76	1750 - 4008
Birth Length (cm)	48.8	$\pm$ 1.83	43 – 54.2
Head Circumference (cm)	34.2	$\pm$ 0.85	30 – 36.7
Mid arm Circumference(cm)	9.28	$\pm$ 0.85	7.2 – 10.4
Ponderal Index	2.3	$\pm$ 0.25	1.66 – 3.3
MAC/HC ratio	0.27	$\pm$ 0.013	0.23 – 0.31

Table 1 shows the Summary statistics on Anthropometric parameters of study subjects. All the babies in the study (n=384) were full term infants with Mean Gestational age 39 ± 0.95 wks. Mean birth weight of study population was 2657 ± 392 grams, the mean length was 48.8 ± 1.83 cm, the mean mid arm circumference was 9.28 ± 0.85 cm and the mean head circumference was 34.2 ± 0.85 cm.

Table 2 : Distribution of Well nourished and Malnourished Infants by different Methods

Nutritional Status	Method							
	CAN SCORE	Number (%)	Birth Weight in grams	Number (%)	MAC/HC ratio	Number (%)	Ponderal index	Number (%)
Malnourished	< 25	124 (32.29)	<2500	113 (29.43)	< 0.27	115 (29.95)	< 2.2	94 (24.48)
Well nourished	$\geq$ 25	260 (67.71)	$\geq$2500	271 (70.57)	$\geq$ 0.27	269 (70.05)	$\geq$ 2.2	290 (75.52)

Distribution of study population as well nourished (WN) and malnourished (MN) according to different methods is depicted in *Table 2. The* CANSCORE classified 32.29% as malnourished and 67.71% as well nourished, Birth Weight classified 29.43% as malnourished and 70.57% as well nourished, MAC/HC ratio classified 29.95% as malnourished and 70.05% as well nourished, while Ponderal Index classified 24.48% as malnourished and 70.52% as well nourished.

Table 3: - Comparison of validity measures of different methods considering Birth Weight as gold standard

Value	CAN SCORE	Ponderal Index	MAC/HC ratio
Sensitivity (%)	92.92	66.37	82.30
Specificity (%)	92.99	92.99	91.88
Positive predictive value (%)	84.68	79.79	80.87
Negative predictive value (%)	96.92	86.90	92.57
Kappa Coefficient	0.8354	0.6242	0.7380

Comparison of validity measures of different methods considering Birth Weight as gold standard is seen in table 3, It was found that when different methods were compared with birth weight as gold standard the Sensitivity, specificity, positive predictive value, negative predictive value and Kappa Coefficient was 92.92%, 92.99%, 84.68%, 96,92% and 0.8354 respectively for CANSCORE, 66.37%, 92.99%, 79.79%, 86.90% and 0.6242 respectively for Ponderal Index and 82.30%, 91.88%, 80,87%, 92,57% and 0.7380 respectively for MAC and HC ratio.

When Kappa statistic was applied it showed almost perfect agreement with CANSCORE and Substantial agreement with Ponderal Index and MAC and HC ratio.

Discussion

Low birth weight is a major public health problem in India, In contrast to what is observed in most developed and many developing countries of the world, two third of these low birth weight babies are with foetal malnourishment[5]. It has been shown that foetally malnourished (growth retarded) babies differ in etiology, neonatal morbidity, mortality and later development from term appropriately grown infants[9].

Most of the classification systems for malnourished babies are based on observed birth weight either below or more than or equal to 2500 grams [10-12]. However, none of the above classification system identifies foetal malnutrition, a term coined by Scott and Usher[13], which indicates a clinical state that may be present at almost any birth weight irrespective of classification of infants into normal birth weight or low birth weight. When CANSCORE is compared with Birth Weight it gave a sensitivity of 84.68% and specificity of 96.92%

The clinical manifestation of foetal malnutrition depends in part on the timing it began during gestation. It is characterized by obvious intrauterine loss of, or failure to acquire normal amount of subcutaneous fat and muscle. Weight, length and head circumference may or may not be affected.

Ponderal index has also been used by various authors to classify intrauterine growth retarded infants. Miller and Hassanein(8) proposed that a full term infant is growth retarded if his PI is < 2.2. Ponderal index relies on the principle that length is spared at the expense of weight during period of acute malnutrition; weight and length velocities may be proportionately impaired so infants with chronic insult *in utero* may be misclassified by PI. When CAN score was compared with Ponderal Index it gave a

sensitivity of 61.29% and a specificity of 93.08% in the present study.

Meadow and colleagues[14] concluded that the MAC/HC ratio, independent of birth weight, readily discriminated the late gestation growth retarded baby. Their study showed that this ratio can be used as a reliable test to identify neonates whose growth is retarded, even when their weight is normal. But those babies whose head circumference is reduced because of proportionate growth retardation might not be identified. The low value in this study might indicate the chronic stress these infants face *in utero.* CANSCORE gave a sensitivity of 75.81% and specificity of 91.92% with MAC/HC ratio. The study re-emphasizes the observations of Metcoff about foetal malnutrition and it is a clinical diagnosis, independent of birth weight for gestational age. The advantage of CAN score is that it is a simple, clinical index for identifying fetal malnutrition and may have the potential to predict neonatal morbidity associated with it without the aid of any sophisticated equipments. A larger subject population would be required to establish the utility of CANSCORE as a good clinical index for predicting neurodevelopment outcome in infants with foetal malnutrition.

Limitations- As it is scoring system based on clinical assessment there may be subjective variation but in present study first 30 subjects were examined and scored with other paediatrician and result are compared which shows they were matched with each other.

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Original Article

Cancer Estimation in Male Population of Patan District, Gujarat

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ABSTRACT

Background: Cancer can be caused by variety of factors and may develop over a number of years. This paper provides a synopsis of the incidence of male cancers in Patan district, Gujarat State.

Objectives: To determine incidence of Head and neck cancers, tobacco related cancers, leading cancer sites and cancer mortality for males in Patan district.

Materials and Methods: The Gujarat Cancer and Research Institute was the prime source of data on cancer cases, along with other sources which were recorded cancer cases contributed data for this study. Information on cases from these sources were subjected to meticulous verification regarding repetition, place of residence and other potential errors. To ensure maximally complete data, cases registered between 1st January 2011 and 31st December 2011 was considered for the present study.

Results: Total 310 male cancer patients were recorded in Patan district. Head and Neck Cancers constituted 47.42% of total cancer in males. Cancer sites associated with tobacco form 60.97% of all cancers in men. Top five cancers in males in this study were tongue, lung, mouth, hypopharynx and larynx. During the year 2011, 85.95% cases were confirmed through primary histology reports. About 60.81% of deaths occurred in 35-64 years of broad age group and 27.03% of deaths were occurred in 65+ years age group.

Conclusion: The tobacco related cancers represent the most preventable form of cancer in our society. Future research should be aimed at improving quality of data for early detection and prevention of tobacco related cancers and head and neck cancers.

Key Words: Incidence Rate, Head and Neck Cancers, Tobacco Related Cancers, Method of Diagnosis, Mortality Rate.

Introduction:

Cancer is the second leading cause of death and disability worldwide, behind only heart disease[1.] More people die from cancer every year than human immunodeficiency virus (HIV), tuberculosis and malaria combined[1-4]. Contrary to about three decades ago when cancer was more prevalent in the developed world, the burden is shifting significantly to the developing countries. According to estimates by the International Agency for Research on Cancer (IARC), in 2008, 53% of the 12.7 million new cases of cancer and 63% of the 7.6 million cancer deaths occurred in developing countries[3]. Three decades earlier, developing countries accounted for a mere 15% of global cancer burden[4]. Cancer is among the ten leading causes of death in India (Central Bureau of Health Intelligence, 2006)[5]. The estimated incidence in the country is 800,000 cases and prevalence is about two million cases. About 25% increases is expected by the year 2015[6].

Patan district is one of the 26 districts of Gujarat state in western India. This district is located in northern Gujarat and bounded by Banaskantha district in the north and northeast, Mehsana district in the east and southeast, Surendranagar district in the south and Kutch District in the west. The district occupies an area of 5742.19 km². The district had a population of 1,182,709 (male 612,100 and female

(570,609) as of 2001 Census. Patan District recorded increase of 14.16 % to its population compared to 1991[7]. Patan has an average literacy rate of 60.40%, slightly higher than the national average of 59.5%. Male literacy is 73.60% and female literacy is 46.30%.

There are no reports on cancer incidence in Patan district; therefore we aimed to get estimation of cancer in male population of Patan district in Gujarat.

Materials and Methods:

The Gujarat Cancer and Research Institute is the base institution for the data collection which caters comprehensive cancer care to a large number of cancer patients. Cancer Registration system of patan district covers more than 100 sources. The trained field staff visited various sources of registration in all government hospitals, private hospitals, nursing homes and diagnostic laboratories besides the base Institution (GCRI) and death registration units in defined area. They actively pursued and collected information on cancer cases reported. Trained staff filled the core form by direct interview with patient or relative at time of registration in GCRI everyday. The inclusion criteria for registration of cases is that patients who have lived in the defined areas of patan district for a minimum period of one year of first diagnosis of cancer. Every cancer death not traceable or not matched with registered cases in record files, with same year or with previous years, was labeled as an 'unmatched death' and the date of death was then taken as the date of first diagnosis, and was so registered in the corresponding year's data file as Death Certificate Only (DCO) cases. During the year 2011, 347 (73.52%) of incident cases were registered from GCRI and 125 (26.48%) were registered from other sources. Other sources can mainly divide into three groups; sources of Patan district, sources of Ahmedabad City and sources of outside Patan district.

Usually the sites lip, tongue, mouth, salivary gland, tonsil, oropharynx, nasopharynx, hypopharynx, pharynx, nose and sinus, larynx and thyroid are considered as head and neck cancers[8].

Anatomical sites of cancer associated with use of tobacco are lip, tongue, mouth, pharynx, oropharynx, hypopharynx, tonsil, esophagus, larynx, lung and urinary bladder included in this study[9]. This study includes data collection, data entry, coding and analysis was as per the National Cancer Registry Programme, (ICMR)[10]. The sites of all cancers were classified on the basis of ICD-10 for site coding [11]. Third Edition of the International Classification of Disease for Oncology is being used for morphology coding[12].

Only invasive cancers (5th digit morphology code 3 or 6) were reported. Benign tumors and in-situ cancers were not included for analysis. In this study, Crude Incidence Rate (CIR), Age Specific Incidence Rate (ASpR) and Age Adjusted Incidence Rate (AAR) are used for analysis. The CIR is calculated by dividing total number of new cases registered during a year by corresponding population of that year and multiplying the result by 100,000. Age Specific Incidence Rate refers to the rate obtained by dividing the total number of cancer cases by the corresponding estimated population in that age group and multiplying by 100,000. As age increases, the incidence of cancer also increases therefore with an increase in the median age of population the cancer incidence also increases in the community. In order to make rates comparable between two populations or countries, the five year age distribution of the world standard population is taken into account to obtain the age adjusted rates (AAR). Truncated Rate (TR) is the rate similar to AAR except that it is calculated for the truncated age group of 35-64 years of age. Cancer diagnosis is made by different methods viz. microscopic verification, radiology
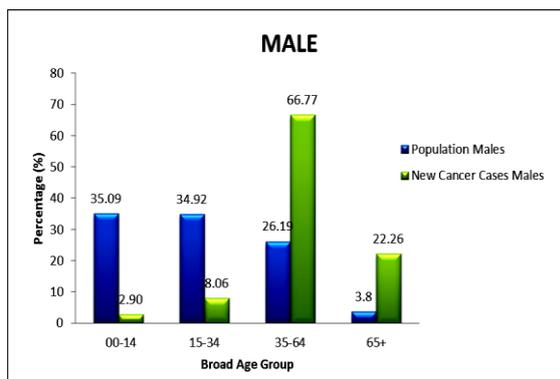
and imaging techniques, clinically, biochemical tests or by endoscopy.

However, a small proportion of cases (2.75%) were registered from the death registers of competent authorities as their incidence during life time could not be traced from any other source. Histological examinations of material obtained from primary site, from metastatic site, cytological diagnoses as well as hematological examinations were included in category of microscopic verification. Primary histology, secondary histology, cytology and bone marrow examinations were considered as detailed microscopic diagnosis in this study.

Results:

During the year 2011, 472 incident cases (310 males and 162 females) were registered in Patan district with Male/Female ratio was 1.91:1. The Crude Incidence Rate (CR) per 100,000 populations per year in male was 43.90. The corresponding Age Adjusted Rate (AAR) was 61.84. The Truncated Incidence rate (TR) in male was 128.17 per 100,000 persons. 2.90 % cases occurred in age group of 0-14 years, 8.06 % cases in 15-34 years, 66.77 % in the truncated age group of 35-64 years and 22.26 % in older age group (Figure:1).
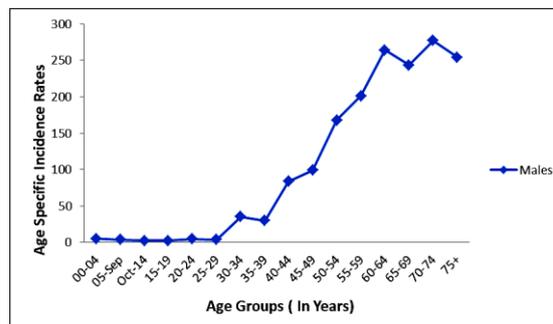
Fig. 1: Percentage of Population and Male Cancer cases by Broad Age groups PATAN District -2011

Cancer incidence rates were found to increase sharply with age for men. The age Specific Incidence Rates have crossed over 100 in 50-54 years age group and was

higher only between the ages 70-74 in males (Figure:2)

Fig. 2: Age specific incidence rate per 1,00,000 population with five years age groups by males PATAN District -2011.

A total of 147 cases of head and neck cancer were registered in Patan district during the year 2011, accounting for 47.42% of total cancer cases. Overall, the most common site was the tongue (29.93%), followed by the mouth (23.13%), hypopharynx (15.65%), larynx (10.2%), pharynx (8.16%), tonsil (5.44%), oropharynx (2.72%), thyroid (2.04%), salivary gland (1.36%). Cancer of nasopharynx and nose, sinus has equal proportion for head and neck cancer in males (Table: 1).

Table 1: Number and Percentage of Head and Neck cancers PATAN District- 2011

ICD Code	Site	Male	
		#	%
C01-02	Tongue	44	29.93
C03-06	Mouth	34	23.13
C07-08	Salivary Gland	2	1.36
C09	Tonsil	8	5.44
C10	Other Oropharynx	4	2.72
C11	Nasopharynx	1	0.68
C12-13	Hypopharynx	23	15.65
C14	Pharynx Unspecified	12	8.16
C30-31	Nose, Sinus	1	0.68
C32	Larynx	15	10.2
C73	Thyroid	3	2.04
Total		147	100
Proportion Of Head & Neck Cancers To Total Cancers In Either Sex (%)		310	47.42

Table 2: Number (#) and Percentage (%) of TRCs, PATAN District-2011.

ICD Code	SITE	MALE		
		#	(a)	(b)
C01-02	Tongue	44	23.28	14.19
C06	Oral Cavity	34	17.98	10.97
C09	Tonsil	8	4.23	2.58
C10	Oropharynx	4	2.12	1.29
C12-13	Hypopharynx	23	12.17	7.42
C14	Pharynx	12	6.35	3.87
C15	Oesophagus	12	6.35	3.87
C32	Larynx	15	7.94	4.84
C34	Lung	35	18.52	11.29
C67	Urinary Bladder	2	1.06	0.65
	T.R.C	**189**	**100**	**60.97**
	All types	310		100

Table: 2 shows the distribution of tobacco related cancers reported in Patan district. Tobacco Related Cancers (TRCs) accounted for 60.97% of all cancer in males. Among the tobacco related cancer sites in males, cancer of the tongue was the most common site (23.28%) followed by cancer of lung (18.52%) and oral cavity (17.98%). These three sites together constituted 59.78% of total TRCs.

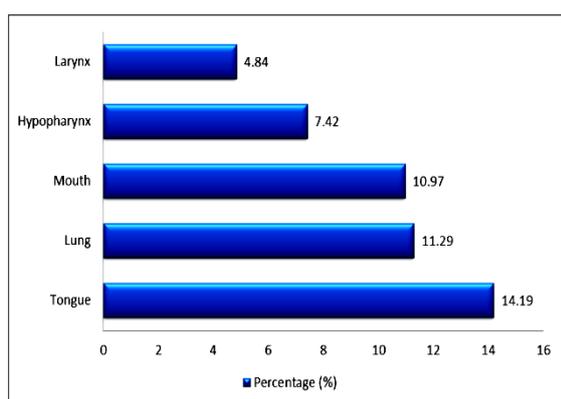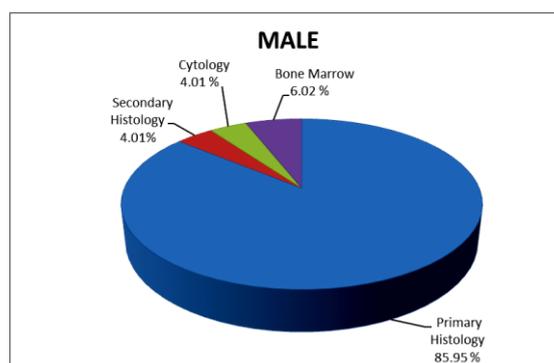**Fig. 3: Five Leading Sites in Males, PATAN DISTRICT, 2011.**

Figure: 3 represents the top five leading sites of cancers in males. Among top five leading sites of cancers, the site tongue (14.19%) ranks first followed by lung (11.29%), mouth (10.97%), hypopharynx (7.42%) and larynx (4.84%)

Graphical presentation of cancers by detailed microscopic diagnosis for males shows 85.95% cases are confirmed through primary histology type, 6.02% cases are through hematological examinations. Cancer cases diagnosed by detailed microscopic diagnosis like cytology and secondary histology type were having equal proportion of 4.01% (Figure: 4).

Fig. 4: Percentage of Distribution of Cancers by Detailed Microscopic Diagnosis and Males, PATAN District, 2011.
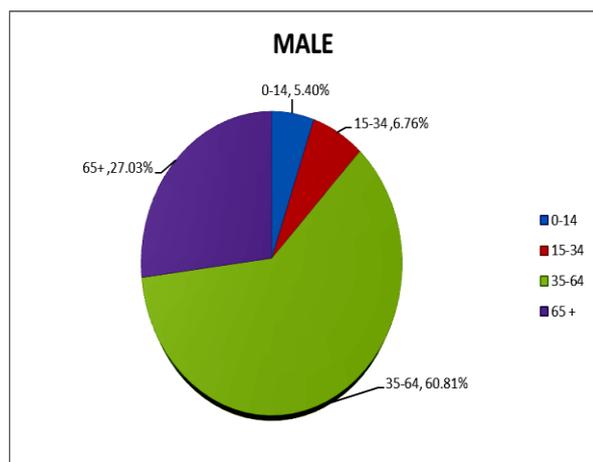

In the year 2011, 74 deaths were registered. Among total male deaths registered in Patan district, lung cancer (13.51%) was the top leading site followed by hypopharynx (9.46%). The Crude Mortality Rate (CMR) in male was 10.48 per 100,000 male populations per year. The corresponding Age Adjusted Mortality Rate (AAMR) was 15.19 per 100,000 male populations. The Truncated Mortality Rate (TMR) in male was 28.60 per 100,000 populations.

Table 3: Number (#) and Percentage (%) of Cancer Deaths with Broad Age Group by Males

Age Group (Years)	Male	
	#	%
0-14	4	5.40
15-34	5	6.76
35-64	45	60.81
65 +	20	27.03
Total	74	100

Mortality to incidence (M/I) ratio for all cancers in males was 23.87%. The highest mortality (60.81%) was found in truncated age group of 35-64 years in males (Table: 3). Figure: 5 shows the graphical distribution of cancer deaths with broad age group by males.

Fig. 5: Percentage (%) of Cancer Deaths with Broad Age Group by Males - PATAN DISTRICT 2011

Discussion:

The present study was a population based study which has covered Patan district of Gujarat. The result suggested that head and neck cancers and tobacco related cancers are the most preventable form of cancer in our society. Cancer of tongue, mouth and larynx are top three leading sites of cancers among head and neck cancers. The average age adjusted incidence rates for head and neck cancers in males varied from 46.1 in Barshi Registry to 116.2 for Delhi registry.[8] There is strong epidemiological evidence to link tobacco habits with the occurrence of head and neck cancers. Head and neck cancers are the sixth most common malignancy and are a major cause of cancer morbidity and mortality worldwide. In India and South East Asia, oral cancer incidence accounts for up to 40% of all the malignancies[13].

The three leading sites among all the tobacco related cancers were tongue, lung and oral cavity contributed 59.78% of all tobacco related cancers. Cancer of the urinary bladder formed a small fraction of the tobacco related cancers in males. In males, the relative proportion of TRC ranged from 33.4% in Bangalore to 50.6% in Ahmedabad[9]. Each year in India an estimated total of 7-9 lakh new cancer cases are detected. Based on the estimation of National Cancer Registry Programme (NCRP), the number of newly diagnosed Tobacco Related Cancers each year in India has been approximately 2.5 lakh[14]. In present study, Tobacco related cancers constitute 61.29% of all cancers in males. Based on Cancer statistics provided by the population based cancer registries (henceforth called as PBCR), the proportion of TRCs among men ranged from 33.4% to 50.6%[9]. India is the second largest consumer of tobacco products and third largest producer of tobacco in the world. [15] More than one-third of adults in India use tobacco in some form or the other. More than 75% of tobacco users, both smokers as well as smokeless tobacco users are daily users of tobacco and their mean age at initiation (for age group 20-34 years) is 17.8 years[15]. Various studies have demonstrated that tobacco use among school going children in India is very high [16,17,18]. India global youth tobacco survey, 2006 confirmed the high prevalence of tobacco usage in school going children (among 13-15 years)[19]. This is an alarming trend towards increased tobacco use in India. Coupled with the fact that India is a second most populous country in the world, this trend will escalate the burden of Tobacco related Cancers in India and the resultant increase in global burden as well. The situation calls for urgent action, taking into consideration its implications on public health including the massive health-cost burden. The silver line is that tobacco related cancers are amenable to primary prevention (by control of tobacco consumption they represent the most preventable form of cancer) and secondary prevention (as most of the TRCs occur in most easily accessible anatomical parts,

thus, rendering its early and easy detection.).

The study findings amply revealed the higher proportion of head and neck cancers and tobacco related cancers among men.

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Original article

The obesity paradox in the distribution of dyslipidemia in obese versus non – obese patients of CAD in Gujarati population

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Abstract:

Background: Cardiovascular diseases (CVD) are the major cause of morbidity and mortality in developing countries. Risk factors for CVD like hypertension, diabetes, dyslipidemia and smoking contribute significantly to atherosclerosis and consequently to CVD. The aim of this study was to observe distribution of these risk factors in Gujarati coronary artery disease (CAD) patients over the entire spectrum of BMI and to look for existence of obesity paradox.

Methods: This randomized and cross-sectional study was done in September, 2010 on 818 subjects. Subjects of established CAD were evaluated by pretested proforma, physical examinations and, tests of lipid profiles, blood sugar levels.

Results: The proportion of hypertension, was significantly higher in >30 BMI group than BMI <25 and 25-30 group (p=<0.0001). Diabetes and dyslipidemia were non-significantly higher in BMI 25-30 than BMI <25 and >30 showing possible effect of obesity paradox. In females, effect of obesity paradox was found in high cholesterol content which was statistically significant (p=0.0465) and low HDL was highest in BMI with <25 than those with BMI with 25-30 and >30 (p=0.1341). The same effect was observed with LDL also but in a non-significant (p=0.6556) fashion. The results found in male population were similar to the females in case of high cholesterol and LDL. Though statistically insignificant the age related dyslipidemia distribution also showed existence of obesity paradox.

Conclusion: In females, high cholesterol was more in BMI <25 than BMI 25-30 and >30 group. Same effect was found in males also but did not reach statistically significant level.

Key words: Obesity Paradox, Cardio-vascular diseases, Hypertension, Diabetes, Dyslipidemia

Introduction

Cardiovascular diseases (CVD) are the most common cause of death and disability in developed as well as developing countries. Almost all of the major coronary heart disease (CHD) risk factors, including lipid disorder, glucose abnormalities, diabetes mellitus (DM), hypertension (HTN), left ventricular hypertrophy, and physical inactivity, are all adversely affected by overweight and obesity. Low high-density lipoprotein cholesterol (HDL-C) imposes higher risk for coronary artery disease (CAD) in the general population

independently of low-density lipoprotein cholesterol (LDL-C) and triglyceride (TG) levels[1].

Though overweight and obesity have adverse effects on CHD risk factors and CHD, numerous studies have addressed the "obesity paradox," suggesting once CV diseases are established, the overweight and obesity seem to have a better prognosis than do their leaner counterparts[2]. In spite of a marked increase in the CAD burden in Gujarati population, lacuna of research exists in the field of obesity paradox. Aim of the our study was to find out proportions and clinical profiles of CAD risk factors amongst thin Gujarati CAD patients compared to obese Gujarati CAD patients and to observe distribution of dyslipidemia (DLD) across the entire spectrum of body mass index (BMI) also to look for any possible cause of "obesity paradox".

Material and methods

Design and Data Collection

This was a cross sectional screening study for presence of CAD risk factors among Gujarati patients. Complete or unrestricted random selection of the patients was used to enrol the subjects. It was conducted in September 2010 at our institute, which is the only tertiary care Centre with superspeciality cardiology course in the state of Gujarat catering to population all across the state. The undiagnosed cases of cardiac problems were screened and randomly selected for confirmation of CAD. Confirmed cases who reported for evaluation were again selected randomly for the purpose of the study. However being Government funded institute all patients that reported to the hospital were assessed and evaluated but were excluded from the analysis if they were not the randomly selected case to avoid selection bias. Sample size of 818 adult patients with established CAD was determined with the help of research aid of sample size survey

software (online calculator-specially designed for epidemiological studies). The study was approved by Institutional Ethics Committee (IEC) and written informed consent was obtained from all the patients. (Patients were enrolled according to Helsinki declaration of 1975, as revised in 2000) The project was handled by trained/qualified hospital doctor having expertise in the field, who were trained about the study protocol prior to the initiation of the study. Dyslipidemia risk and impaired blood sugar levels were determined as per National Cholesterol Education Program (NCEP) – Adult Treatment Panel (ATP) III guidelines and American Diabetes Association (ADA) respectively. Patients were screened and tested for the presence of HTN, DLD, DM and smoking. Age, sex, body mass index (BMI) and other relevant variables were also recorded at our institute. Three categories of BMI were designed according to the WHO standards[2].

Serum Lipid and Glucose Analysis

The sample analysis was carried by an automated clinical chemistry analyzer. Serum glucose was measured by oxygen rate method employing a Beckman oxygen electrode (glucose oxidase). Total cholesterol (TC), low density lipoprotein cholesterol (LDL-C), high density lipoprotein cholesterol (HDL-C) and triglyceride (TG) concentrations were measured by International Federation of Clinical Chemistry (IFCC) approved enzymatic methods.

Definitions and Preferred Cut-off Values

Person was considered to be hypertensive if they have history of HTN followed by treatment of anti-hypertensive medications or their BP during the visit was exceeding 140 systolic or 90 diastolic on two different measurements.

Person was considered to be diabetic if they had known history of type I or type II

diabetes or was on anti-diabetic medications including insulin or their fasting blood sugar was higher than 125 mg/dL or random blood sugar more than 200 mg/dL. Person was considered to have dyslipidemia if they have known history of DLD before or they were on anti-lipids medications or they had any one of the following criteria of lipid profile. (Total cholesterol >200 or Triglyceride >200 or LDL >130 or total lipids >400). Person was considered to be a smoker if he or she used to smoke cigarettes or any other form of smoked tobacco for more than 1 year.

Statistical Analysis

All collected data was analyzed by SPSS v 20. Quantitative data was expressed as mean plus-minus SD whereas qualitative data was expressed in percentage. Since all the data follows normal distribution, t-test, one way ANOVA and chi-square test had been used to calculate p-value. p-value, <0.05 was accepted as statistically significant.

Results

Results of the current study clearly indicates that proportion of hypertension was significantly (p<0.0001) higher in BMI >30 as compared to BMI 25 to 30 and <25, whereas dyslipidemia worsens in those with BMI >30 than those with BMI <25. Dyslipidemia and DM were insignificantly higher in BMI 25 to 30 group than BMI >30 group which may reflect possible obesity paradox (table 1). Gender comparison showed almost equal distribution of the risk factors of CVD in males and females. Smoking was significantly (p=0.0001) higher in males than females (table 1).

The distribution of dyslipidemia and lipid abnormalities in individuals with various BMIs has been shown in table 2. It is showing that low HDL was more in those with BMI >30 as compared to those with BMI <25 and 25-30. Proportion of low HDL was found to increase with the increase in BMI from <25 to >30 as expected obesity

Table 1: Prevalence of risk factors in various BMI and gender groups.

BMI & Risk factors				
	< 25 n=411 (%)	≥ 25-30 n= 310 (%)	≥ 30 n=97(%)	p-value
HT	120 (29.2)	134 (43.2)	57 (58.8)	<0.0001
DM	45 (10.9)	41 (13.2)	10 (10.3)	0.5768
DLD	43 (10.5)	49 (15.8)	14 (14.4)	0.096
SM	17 (4.1)	12 (3.9)	3 (3.1)	0.8916

Gender and Risk factors		
	Female n=334 (%)	Male n=484(%)	p- value
HT	124 (37.1)	187(38.64)	0.7157
DM	39 (11.67)	57 (11.77)	0.9468
DLD	42 (12.6)	64 (13.2)	0.8686
SM	2 (0.6)	30 (6.2)	0.0001

HT-Hypertension, DM- Diabetes Mellitus, DLD-Dyslipidemia, SM-Smoking, BMI-Body Mass Index

effect on dyslipidemia, But it was not statistically significant. However percentage of high LDL was found to reduce in BMI >30 group as compare to 25-30 group in a non-significant manner. In females, effect of obesity paradox was found in high cholesterol content which was statistically significant (p=0.0465). Low HDL was highest in BMI with <25 than those with BMI with 25-30 and >30 showing possible existence of obesity paradox (p=0.1341). The same effect was observed with LDL also but in a non-significant (p=0.6556) fashion. The results found in male population were similar to the females in case of high cholesterol and LDL as shown in table 2, however but it was statistically insignificant.

Though statistically insignificant the age related distribution of dyslipidemia was more in younger age group (20-39 years) with BMI of <25 than those with BMI >25

Table 2: Lipid profile of various BMI groups											
	Lipid profile & BMI-All patients			Lipid profile & BMI-Female			Lipid profile & BMI-Male			
	<25, n=411	25-30, n=310	=30, n=97 p value	<25, n=162	25-30, n=108	=30, n=64 P value	<25: n=249	25-30, n=202	=30, n=33 p value	
High Cholesterol	5 (1.2%)	2 (0.6%)	3(3.1%) 0.160	2 (1.2%)	0	3(4.7%) 0.0465	3(1.2%)	2 (1.0%)	0 0.8106	
Low HDL	61(14.8%)	53(17.1%)	21(21.6%) 0.250	27(16.7%)	9(8.3%)	10(15.6%) 0.1341	34(13.7%)	44(21.8%)	11(33.3%) 0.0062	
High LDL	23(5.6%)	24(7.7%)	6(6.2) 0.507	10(6.2%)	4(3.7%)	3(4.7%) 0.6556	13(5.2%)	20(9.9%)	3(9.1%) 0.1581	
High TG	9(2.2%)	9(2.9%)	4(4.1% 0.546	10(6.2%)	4(3.7%)	3(4.7%) 0.9610	5(2.0%)	6(3.0%)	2(6.1%) 0.3794	
Presence of smoking	17(4.1%)	12(3.9%)	3(3.1%) 0.891	2(1.2%)	0	0 0.3437	15(6.0%)	12(5.9%)	3(9.1%) 0.7745	

Table 3: Dyslipidemia distribution in various BMI and age group patients.

Dyslipidemia + BMI				
	< 25 n=43 (%)	≥ 25-30 n=50 (%)	≥ 30 n=13 (%)	p-value
<20	0 (0)	0 (0)	0 (0)	<0.0001
20-39	5 (11.6)	3 (6)	0 (0)	0.3232
40-59	26 (60.5)	35 (70)	8 (61.5)	0.6043
≥60	12 (27.9)	12 (24)	5 (38.5)	0.5779

In age group 40-59, the BMI 25-30 group patients were having higher proportion of dyslipidemia as compared to >30 BMI group. Moreover in ≥60 age group cases of dyslipidemia were higher in <25 BMI than 25-30 group showing possible existence of obesity paradox.

Discussion

Obesity is associated with cluster of metabolic complications, increasing the risk of hypertension, diabetes, dyslipidemia, all aggregate independently with BMI[3]. Dyslipidemia associated with obesity plays a major role in development of atherosclerosis and CVD in obese individuals. All components of dyslipidemia, including higher triglycerides, decreased HDL levels, and increased LDL particles, are found to be atherogenic[4]. Largest survey of the relationship of obesity on lipids is the Third National Health and Nutrition Examination Survey (NHANES) also shows that dyslipidemia is strongly associated with obesity as compared to non-obese patients, irrespective of age, sex, and race[5].

Previously only BMI was used as a screening tool for the risk assessment of metabolic syndrome. But several studies have shown that even normal weight subjects, those with a BMI <25 may have the presence of metabolic risk factors.

Numerous studies have addressed the "obesity paradox," suggests once CV diseases are established including CHD; the overweight and obesity seem to have a better prognosis than do their analogous. Even large meta-analyses of CHD and heart failure have demonstrated better event-free survival in patients with overweight and obesity compared with "normal"-weight patients. Galale et al have recently assessed 4.4 year mortality in more than 2300 patients who had peripheral artery disease and underwent major vascular surgery. Their follow-up showed powerful obesity paradox with progressive reductions in mortality in normal BMI, overweight, and obese groups compared with underweight patients[6].

Even though there is a higher prevalence of hypertension in obesity, recent data shows an obesity paradox. Uretsky, *et al.* [7] investigated effects of obesity on CV outcomes in more than 22000 treated hypertensive patients. During 2- year follow-up, mortality was 30% lower in overweight and obese patients, (despite less effective blood pressure control) compared with normal weight group. In aggregate, these studies suggest that although obesity may be a powerful risk factor for hypertension and left ventricular

hypertrophy, obese hypertensive patients may paradoxically have a better prognosis, possibly because of having lower systemic vascular resistance and plasma renin activity compared with leaner hypertensive patients[8].

Although obesity paradox has been described in a number of studies of clinical populations over the last decade, in terms of better event free survival in overweight and obese individuals as compared to leaner counterpart once cardiovascular disease has been established [9,10,11].There are few studies assessing obesity paradox in prevalence of risk factors like dyslipidemia, hypertension and type II DM obese versus non-obese individuals in Guajarati population, our study described that proportion of CVD risk factors like hypertension and dyslipidemia increases significantly as BMI increases from <25 to >30, as expected. In females, percentage of lipid abnormalities (high cholesterol, low HDL and high LDL) was highly associated with low BMI group (<25) in contrast to high BMI group (25-30 & >30), where lesser proportion of lipid abnormalities were present. So possible obesity paradox exit in this study, in high lipid abnormality in relation to BMI. Dyslipidemia was also more distributed in low BMI individuals (<25) than those with high BMI (>25).

Part of explanation of the obesity paradox has been blaming on limitations of the BMI assessment of obesity, methods other than BMI (cardio respiratory function; metabolic equivalent, % body fat) may be better to detect obesity and predict increased cardiovascular risk[12].

Conclusion

The proportion of high cholesterol is more in those individuals with BMI >25 than BMI 25-30 and >30 suggesting possible obesity paradox, It is statistically significant in female (p = 0.0465) but not in male (p = 0.8106). Dyslipidemia is slightly more in lean and overweight population as compare to obese individuals, though it was statistically significant.

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Short Communication

A community based study to assess the awareness about the coronary risk factors in rural Maharashtra.

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Abstract

Background- Since the key to combating the increased incidence of CAD is the control of known risk factors by a population based strategy aimed at comprehensive risk reduction; it is pertinent to study the existing level of awareness about coronary risk factors.

Aim- The present survey was therefore conducted to assess the level of awareness about selected risk factors and symptoms of CAD in rural Marathi population.

Methods- The present community based survey was carried out in the rural area of district Pune using a structured questionnaire during May-August 2012. A modified WHO questionnaire adapted to local conditions was used for data collection.

Results - Only 36% of the study subjects were aware about coronary artery disease and among these, awareness was most common about the symptom of chest pain/discomfort (98.96%) followed by sweating, sinking feeling, and sudden weakness. Least awareness was about nausea/vomiting (18.55%) as a symptom of CAD. Less than two-third (61%) knew about alcohol consumption as a modifiable risk factor whereas more than a half knew that tobacco consumption (58%) is a modifiable risk factor of CAD.

Conclusion –The study demonstrated general lack of awareness about these risk factors especially about modifiable factors. Therefore it is need of the hour to launch IEC activities like health talks, role plays and health exhibitions especially in local language.

Key words: rural, awareness, coronary risk factors.

Introduction

It is predicted that cardiovascular diseases will be the most important cause of mortality in India by the year 2015.[1,2] Contemporary research has indicated that the rise in CADs (Coronary artery disease) reflects a significant change in diet habits, physical activity levels, and tobacco consumption worldwide as a result of industrialization, urbanization, economic development and food market globalization.[3] People are consuming a more energy-dense, nutrient-poor diet and are less physically active. Imbalanced nutrition, reduced physical activity and increased tobacco consumption are the key lifestyle factors.[4]

Since the key to combating the increased incidence of CAD is the control of known risk factors by a population based strategy aimed at comprehensive risk reduction, it is pertinent to study the existing level of awareness about coronary risk factors in detail. According to best of our knowledge level of awareness about coronary risk factors in this area i.e. in rural Maharashtra has not been closely investigated by the community experts in the field.

In view of the rising trend of CAD, as brought out by various studies and paucity of data with respect to the coronary risk factors especially in rural settings in Maharashtra, the present community based study was undertaken to study the awareness among the rural population about these coronary risk factors so that risk reduction measures can be recommended.

Materials and methods

The present community based survey was carried out in the rural area of district Pune using a structured questionnaire. The area selected was the field practice area of a tertiary medical centre in Pune. It's around 40 km from Pune on the Solapur Highway. It has been adopted by this tertiary medical centre for rural training of under graduate and post graduate students in community medicine and for provisioning of health services to the villagers.

Sample size estimation was based on village population 1600 with 700 more than 35 years (approx.), assuming the prevalence of coronary risk factors to be 25% in a rural setting, 5% absolute error of margin and 95 per cent confidence interval. Following formula was used for calculating the minimum sample size, taking into account the 'Finite population'.[5] $n = Nz^2 pq /\{d^2(N-1) + z^2 pq\}$. Accordingly, the sample size was worked out to be 204.

All the residents of the village aged 35 years and above (both male and females) were serially listed and subjects for the study were chosen by simple random sampling from the sampling frame using random number table. Only those above 35 years were added because this is the age group in which the incidence of CAD increases geometrically as most of the literature suggests. A questionnaire was framed under supervision and consultation with the experts for the purpose of capturing socio-demographic information, history of alcohol consumption, tobacco consumption and physical activity etc and other relevant information. The questionnaire was pilot tested on 20 subjects and amended for clarity with the addition of some answer options and was modified accordingly. The questionnaire was designed in English initially and later translated in Marathi and retranslated to English to check validity of questions contained in order to ensure that the respondents were able to comprehend the questions well. Before the interview, the subjects were informed about the scope and nature of the study and were fully assured strict confidentiality.

All those who did not give informed consent for participating in the study and those who were known to be suffering from the coronary heart disease (supported by history or relevant documents) were excluded from the study. Permission from Institutional Review Board was sought before the commencement of the present study. Study population was explained about the nature and purpose of the study and requested to participate. Informed consent of the participants was taken.

House to house survey was carried out in order to conduct interview schedule. The interview schedule was standardized and on an average, it took around 35 - 40 minutes for each individual. Questionnaire was presented and factual data recorded by the investigator.

All the questionnaires were manually checked and edited for completeness and consistency and were then coded for computer entry. Finally they were compiled and summarized. The collected data was entered in Microsoft Excel. Coding of the variables was done. The analysis was done by Statistical Package for the Social Sciences (SPSS) version 20. Interpretation of the collected data was done by using appropriate statistical methods like percentages and proportions.

Results

The present study included a total of 272 subjects in the age group >35 years. There were 144 males and 128 females in the study sample with their mean age 57.33± 12.59years and 50.52± 12.07 years respectively. Majority of the study subjects belonged to socio-economic scale (SES) class 5 followed by class 4 of Prasad scale. Roughly three-fourth of the study subjects were illiterate and out of those educated, majority were educated up to the primary level only.

Table 1: Awareness among Study Subjects about selected Risk Factors of CAD

RISK FACTOR	No. of subjects who considered the selected risk factors	
	MODIFIABLE No (%)	NON-MODIFIABLE No (%)
Age	0 (0.0)	97 (100.0)
Sex	18 (18.56)	79 (81.44)
Family History	4 (8.89)	93 (91.11)
Alcohol Consumption	60 (61.86)	37 (38.14)
Tobacco Consumption	57 (58.34)	40 (41.66)
Physical Inactivity	89 (92.30)	8 (7.7)
High Blood Pressure	88 (90.90)	9 (9.1)
Central Obesity	91 (93.54)	6 (6.46)
Elevated Serum Cholesterol	89 (92)	8 (8)
Diabetes Mellitus	14 (14.43)	83 (85.57)

A total of 97 (35.67%) out of a total of 272 study subjects were not aware about coronary artery disease. As can be seen from figure1, among those who were aware, almost all were aware of 'chest pain' (98.96%) as a symptom of CAD but majority was not aware about remaining symptoms of CAD.

Among those study subjects aware of CAD, all knew about age being a non-modifiable risk factor and a very high majority knew about sex (81.81%) and family history (91.11%) as a non-modifiable risk factor. (Table 1)
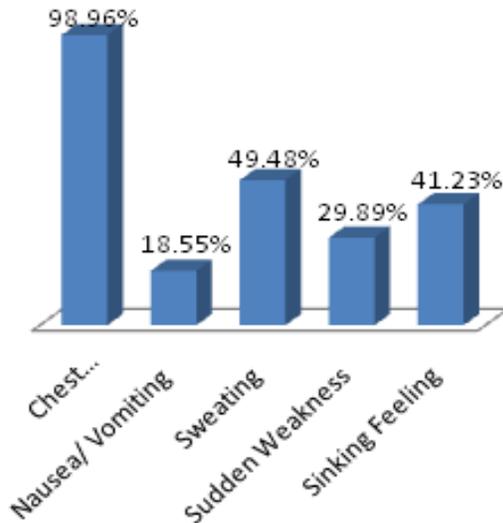
Discussion

A cross sectional study on awareness of coronary risk factors among the rural population in a village in dist. Pune of Maharashtra, India was performed in this survey. Majority of the study subjects in our study were aware (64.33%) about coronary artery disease as against awareness among 41% of the study subjects in a study conducted on risk factors for CAD by Saeed et al in All India Institute of Medical Sciences (AIIMS).[6] The small difference may be because of the increased awareness among the already affected patients in the AIIMS study.

Among those study subjects aware of CAD (64.33%), all knew about age being a non-modifiable risk factor and a very high majority of more than three quarters knew about sex (81.44%) and family history (91.11%) as a non-modifiable risk factor. Slightly less than two-third (61.86%) knew about alcohol consumption being a modifiable risk factor of CAD. More than a half knew (58.33%) that tobacco consumption is a modifiable risk factor.
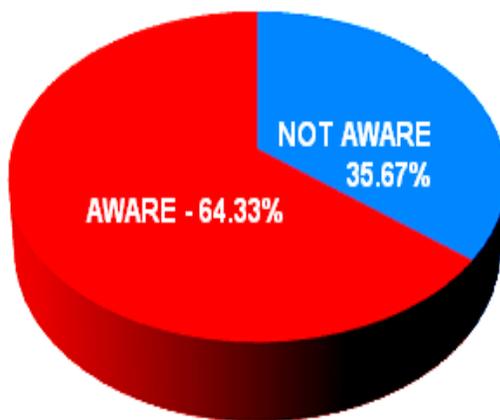
A very high majority were aware that sedentary habits (92.30%), high blood pressure (90.90%), central obesity (93.54%) and elevated serum cholesterol (92.0%) are modifiable risk factors of CAD. Majority thought that diabetes mellitus (85.57%) is a non-modifiable risk factors. This was against the findings as observed by Saeed et al in their study conducted at AIIMS.[6] A study in Saudi Arabia by Khattab MS et al shows that physically inactive people were least aware of their risk of CAD.[7] Difference in rates is due to different parameters for determining the level of awareness and different socio-economic and cultural conditions prevalent in these populations

besides differing age groups constituting the study.

Figure 1- Awareness about symptoms of CAD

Conclusion

The study demonstrated a glaring lack of awareness about these risk factors especially about modifiable factors. Therefore it is need of the hour to launch IEC activities like health talks, role plays and health exhibitions especially in local language. Action, in conjunction with all the stakeholders of the village should be initiated for creating more job opportunities so as to improve the overall socio-economic status of the community.

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<u>Short Communication</u>

Assessment of Quality of Raw Milk Samples from a Jurisdiction of Northern India

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<u>Abstract</u>

Background : Milk is globally described as complete diet. Milk is most commonly diluted with water - this not only reduces its nutritional value, but contaminated water can also cause additional health problems.

Objectives : To ascertain the composition and level of adulteration in the collected raw milk samples

Methodolog: A total of 90 milk samples were collected from milk vendors in Tricity (Chandigarh, Panchkula and Mohali) and were analyzed for total solids contents (milk fat %, milk solids not fat %) using standardized methods.

Results : Average fat content was 4.6±1.37%, SNF was 7.87±1.33%and TS was 12.4±1.93 %. Only 21 samples (23.33%) met standards prescribed by Food Safety and Standards Authority of India, (FSSA) 2006. No other adulterants such as starch, urea, sodium hydroxide etc. were found in any of the collected milk samples.

Conclusion: Quality of 77% of the collected milk samples from Tricity (Chandigarh, Panchkula, Mohali) was below the standards. Therefore, regular check up of milk should be carried out at various critical control points.

Key Words: Adulteration, Milk Solid Not Fat, Total Solids

<u>Introduction</u>

Milk is globally described as a complete diet because of presence of essential components like proteins, milk fat, lactose, various minerals and vitamins in a highly digestible form for normal growth of human being[1]. Calcium and other vitamins and minerals in milk make it an important part of a healthful diet for people of all ages. Milk is also a good source of energy as it has lactose (milk sugar). Milk contains Total Solids (TS), Solid Not Fat (SNF) and milk fat. Milk comes in various fat percentages which one can buy depending on the individual needs. Solid-not-fat content contains lactose, proteins and minerals.

India - the world's largest milk producer – accounts for around 20 per cent of global milk production. Most of it is consumed domestically [2]. In India, nearly half of the milk processed by the organized dairies comes from buffaloes[3]. Unfortunately, due to unorganized and non regulated marketing system, the quality of milk is hardly maintained at consumer level. There is hardly any day when we don't find any news report of milk adulteration appearing from various parts of country.

Adulteration of milk may be defined as addition of any material to the milk, or removal of any constituent of the milk. A recent study conducted by Food Safety and Standards Authority of India (FSSAI) found that almost 70 percent of the samples taken nationwide were contaminated or watered down[4]. Milk is most commonly diluted with water - this not only reduces its nutritional value, but contaminated water can also cause additional health problems. As per The Food Safety and Standards Act (FSSA), 2006, and its Rules and Regulations, 2011, adulteration of milk is not allowed and it is punishable with fine and imprisonment. So, the present study was undertaken to ascertain the composition and level of

adulteration in the collected raw milk samples from the study area.

Methodology

A cross sectional study was done in Tricity (Chandigarh, Panchkula and Mohali) located in northern part of India during January- February, 2010. Sample size was obtained by entering information in WHO-EPI Info software (Type 1 error as 0.05, Type 2 error 0.20; error margin 10; P= 0.50; Q=0.50). For the study, a total of 90 milk samples, 30 from each area (Chandigarh, Mohali and Panchkula) were collected from milk vendors daily for nine days from 6 am to 10 am as most of the milk vendors distribute milk to customers in these timings.500 ml of open buffalo milk and 500 ml packet of branded milk (Vita,Verka, Reliance, Mother Dairy) were purchased from milk vendors (fixed shops and mobile vendors on motorcycles/bicycles) as customers. The samples were collected from urban areas of the Tricity.

Prior to data collection, the researcher was trained for a week in milk sample collection. The researcher collected the milk samples using standardized sample collection technique in a sterilized glass bottle with cap, duly labeled with a waterproof marker in coded numbers. The samples were then kept in icebox and were brought to Food and Health Laboratory, Chandigarh for analysis. The milk samples were analyzed for total solids contents (milk fat %, milk solids not fat %) using standardized methods of analysis[5].Total solids content was calculated by the following formula:

Total solids (%) = Weight of dried sample Weight of milk sample $\times$ 100. Fat content was determined using Gerber method [6]. Solids not fat (SNF) content was determined by difference as reported by Harding (1995)[7], using the following formula: SNFcontent (%)= TS (%) – Fat (%)

The data was analyzed in SPSS -16. The concentrations of milk components were compared with the standard values using one-sample t test. Milk composition was compared across different areas by one-way ANOVA.

Results

The present study depicts that the average fat content in collected milk samples was 4.6±1.37%, solid-not-fat was 7.87±1.33%and total solid was 12.4±1.93 %.The results of the milk analysis in the present study was compared with the standards prescribed by FSSA, 2006 by means of one sample t test, which showed that the difference between the collected samples and standards was statistically significant (Table- 1).

Table 1 Comparison of nutrient contents of collected samples with FSSA standards

Nutrients (%)	Collected Samples Mean ± S.E(Range)	FSSA Standard (%)	P value
Fat	4.6±1.37 (0.9-7.8)	6	0.01[*]
Solid not fat	7.87±1.33 (5.2-10.3)	9	0.01[*]
Total solids	12.4±1.93 (8.10-16.9)	15	0.01[*]

*Significant at 0.05 level

The amount of fat, solid-not-fat and total solids were found to be lower than the suggested standards of FSSAI. The milk nutrients from three different areas of Tricity were compared by one-way ANOVA, where it was found that there was statistically significant difference between the nutrients in samples from Chandigarh, Panchkula and Mohali (Table 2). A total of 15 milk samples were from organized sector and 75 were from unorganized sector. The distribution

Table 2 Comparison of nutrient contents between different jurisdictions using one-way ANOVA

Nutrient (%)	Area			F	P value
	Chandigarh (n==30)	Panchkula (n==30)	Mohali (n==30)		
Fat	5.4±1.01	4.01±1.31	4.39±1.41	6.514	0.003[*]
Solid not fat	8.47±0.74	7.69±1.80	7.44±1.06	10.575	0.000[*]
Total solids	13.87±1.57	11.69±1.95	11.83±1.47	3.544	0.035[*]

*Significant at 0.05 level

Table 3 Comparison of nutrient contents between sectors

Nutrient (%)	Organized Sector	Unorganized Sector	P-value
Fat	5.42	4.60	0.04[*]
Solid not fat (SNF)	8.45	7.	0.04[*]
Total solids(TS)	13.87	12.14	0.01[*]

*Significant at 0.05 level

and quality of milk from these sectors is shown in Table 3.

Out of total 90 samples collected, only 21 samples (23.33%) met standards prescribed by FSSA, 2006. Out of these 21 samples, 15 samples were standardized milk samples of some company (Verka, Reliance, Vita etc.) and only 6 (6.6.7%) were supplied by milk vendors. No adulterant (starch, skimmed milk powder, urea, sugar, caustic soda, sodium hydroxide) found in any collected milk samples.

Discussion

Milk supply in Tricity (Chandigarh, Panchkula, Mohali) takes place primarily through three different marketing channels i.e. direct sellers, milk collection centers, milk vendor shops and dairy farms from the surrounding areas. Thus, milk is hardly assumed to be of high quality.

Present study found that the milk samples had low average fat , SNF and TS as compared to standards of FSSA .Similar results were found in study conducted in Pakistan by Javaid et al where the milk samples collected from milk vendors had average fat content of 5.20%, SNF of 8.25% and TS of 13.45%[8].A study conducted by the Food Safety and Standards Authority of India (2011) throughout the country on 1791 milk samples found that the total non-conforming samples to the FSSA standards were 1226 (68.4%) [9]. A study conducted by Menon in Hyderabad city of Pakistan also found that chemical quality of milk samples were inferior and did not even meet the minimum legal requirement All the samples from the canteens of different hospitals were found skimmed and adulterated with water[10].Similar results were also found in studies conducted in Izmir (Turkey) [11], Tirupati (India) [12] Faisalabad (Pakistan) [13]. The reason for this could be due to the fact that milk vendors want to maximize their profit and moreover, even if caught, there are no stringent provisions under the current legislation, which further motivate them to do so. According to FSSA, 2006 and its rule 2011, any person who sells to the purchaser's prejudice any food which is not in compliance with the provisions of this Act or the regulations shall be liable for punishment of six months and fine[14]. The total number of samples examined under FSSA,2006 in India from 2006-2008 were 325500 out of which only 11% were found to be adulterated or misbranded, out of which, only 13.6% were convicted[15]. This shows the lax implementation of rules of the Act and vendors take advantage of that to maximize their margins.

The present study found that around 77% (69/90) of the milk samples were not according to standards of Fat, SNF and TS and are diluted with water. However, other adulterants were not found in any of the samples. A study by FSSA found 48% non-conforming milk samples in Chandigarh, all of which contained glucose and skimmed milk powder[9]. These products are added to enhance SNF Percentage in the milk. Similar results were also found in study by Lateef et al in Pakistan where by adulteration of milk samples by water, urea, formalin, hydrogen peroxide and cane sugar was observed in 93%, 86%, 46%, 13% and 93% samples, respectively13 and in a study in North East India where adulteration with water was present in milk from all the dairies.[16]

Present study showed the significant difference in the milk samples collected from Chandigarh, Panchkula and Mohali with regard to fat, SNF and TS with better average in Chandigarh as compared to adjoining areas. However study conducted by Sreedhar et al on the milk samples of local vendors of Tirupati found no significant difference in the milk samples collected from dairies of Sangam, Balaji and Heritage with regard to fat, SNF percentages and had high percentage of water[12].

The present study also revealed that milk sold by standard milk companies were up to the mark whereas the milk from vendors selling loose milk is adulterated with water. Similar results were found in study by FSSA where out of total 68.9% non confirming samples from urban areas, more deviation from standards (66.6%) were found in loose milk samples as compared to packet samples (33.4%) [9].

Conclusions and Recommendations

In the present study, preliminary investigations were carried out to ascertain the chemical characteristics of raw milk samples collected from different parts of Tricity. Based on above mentioned, it can be concluded that quality of 77% of the collected milk samples from Tricity (Chandigarh, Panchkula, Mohali) was below the standards prescribed by FSSA, 2006.However, no other adulterants such as starch, skimmed milk powder, urea, sugar, caustic soda, sodium hydroxide was found in any of the collected milk samples. These findings of the study highlight the need to strictly monitor the quality of the milk available in the market by the concerned governmental regulatory bodies. It would be a great interest if further investigations are to be carried out to examine other organic and inorganic components of milk. The study will also create awareness at consumers level in Tricity.

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PSM IN A NUTSHELL:-

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PSM is a multi disciplinary branch. It has evolved as both basic as well as applied science. Two important concerns of PSM are Health Promotion and Disease Prevention in community. The understanding of PSM subject is important to all branches of Medicine. At the same time, its deep understanding and skills help in health policy formation, planning and implementation.

The subject embraces various disciplines like Epidemiology, Sociology, biostatistics, nutrition, Health Management, Health Communication, Health Environment and Medical Entomology, Health system and Health Programs, Health related policies & laws etc.

Short Communication

Data Validation of Vitamin A supplementation under RCH programme among poor performing blocks of Surat district.

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Abstract

Introduction: Effective systems for monitoring progress and outcomes are critical for all programme implementation. Community, District and National levels require appropriate information for decision-making. Information systems on coverage of interventions can serve as a powerful evidence-based tool for programming.

Objective: The study was planned to assess the availability, accessibility, utilization and effective utilization for Vitamin A Supplementation services of Reproductive Child Health programme among poor performing blocks of Surat district and to analyze the plausible causes of major bottlenecks for effective coverage.

Methods: Cross Sectional study with unit 10 PHCs and from each PHC two sub centre villages were selected randomly in Surat district.

Results: Vitamin A availability at studied PHCs was 79.6%. Accessibility of Vitamin A during monthly Immunization session was 96.4%. Vitamin A coverage at individual PHC was 111.3%. Adjusted utilization of Vitamin A was 93.4%.

Key Words: Data Validation, Immunization

Introduction

Under RCH-II programme, the Government of Gujarat (GOG) is making every effort to improve the quality of health services in rural areas. Therefore, it becomes essential to understand the current status by evaluating important components of Reproductive Child Health activities. It is with this background, this exercise was carried out to assess the status of Reproductive Child Health programme among poor performing blocks of Surat district.

This study was carried out to strengthen the RCH activities by validating records of PHC. The tool for validation used in this study was based on John Hopkins monitoring steps – Availability, Accessibility, Utilization, Adequate Coverage and Effective Coverage; incorporating the BDCS strategy (Border District Cluster Strategy).[1] Surat district is currently having 9 talukas after its separation from district Tapi. It has having an area of 4326.97 sq km with the highest population density in Gujarat as per 2011 census. The population of whole Surat district is 60,79,231 as per 2011 census provisional data which constitutes 10 percent of the state population and it also shows highest percentage decadal variation (42.19) in Gujarat according to census 2011 provisional data. Sex ratio of Surat district decline from 810 in 2001 to 788 in 2011 census.[2] The literacy rate (population age 7+ years) of the district is 86.65 percent (91.05 percent males and 81.02 percent females). [2] Surat district is at advantageous position compared to the state in terms of literacy as well as the extent of urbanization.

Methodology:

The study was planned in the poor performing blocks of Surat District as per the 2010 RCH Programme Report of Surat District. So Poor performing 2 blocks of Surat district were selected for this study on the basis of Immunization Coverage of less than 70%. Validation activity was done in seven poor performing PHCs of Bardoli (6

PHCs) and Mangrol (4 PHCs) block of Surat district.

Sample Size: 10 PHCs and from each PHC two sub center villages were selected randomly from Bardoli and Mangrol block of Surat District.

   (a) Data Collecting Teams: Each PHC was visited by a team of 4 Members (Assistant Professor as team leader and three faculties /resident doctors) from the department of Community Medicine, GMC, Surat. Two members validated the PHC data while the other members covered the Sub centre for data validation and collection. Thus, one unit was covered in one day. The field investigators were trained for collection of quality data and adherence to the uniform guidelines for data collection.

   (b) Data Collection: Total five teams were formed and they validated one PHC per day. So total 2 days field work was carried out (10 PHCs). Standard prescribed format (Modified Johns Hopkins) was used for data collection. Sub centre and PHC villages will be surveyed for data validation. Team picked adequate numbers of beneficiaries (at least 3) for each of the intervention to be verified. Thus, exercise was carried out in 10 PHCs, 20 Sub Centre villages and 60 beneficiaries for each intervention.

   (c) Study Tool: Modified Johns Hopkins Module was used for data collection separately at PHC, Sub centre and Village level[1].

   (d) Data Analysis: Reference period for data collection was decided from 1st March 2010 to 28th February 2011. Data once collected was entered and analyzed in MS Excel as per guidelines of Modified John Hopkins criteria.

Results:

This validation exercise was carried out in poor performing 10 PHCs (Primary Health Centre) of two blocks of Surat district to strengthen RCH activities. The data was collected for the reference period 1st March 2010 to 28th February 2011. The following indicators of Surat district were used throughout in this exercise.

Birth Rate: 16.83 per 1000 live births[3]

Infant Mortality Rate: 16.08 per 1000 live birth[3]

Proportion of home deliveries by untrained birth attendant: 0.45 (Factor)[3]

For Vitamin A supplementation, the target population taken was estimated number of under 3 children who survived till the age of 9 months.

1. Availability

Since Vitamin A 1st and 2nd doses are linked with immunization, the availability was considered as percentage of weeks Vitamin A was available in adequate quantity during the reference period. This method would take care of availability even where 2 – 5 doses are given in 6 monthly campaign mode.

Availability was calculated for individual PHC by calculating periodicity (in weeks) and adequacy of Vitamin A quantity in ml. The lowest value was considered. District estimates for availability were calculated by doing average of PHC figures. Thus, the availability for Vitamin A supplements for the district obtained was 79.6%.

2. Accessibility

This is defined as the geographical reach of the services for practical purpose. At some point of time one need to start looking at socio-economic consideration of access to services. According to National UIP guidelines, every village should have a monthly immunization session. During this

study, for assessment of accessibility three categories of inhibitions (including hamlets) were included in the numerator.

Category-a: Inhibition with more than 1000 population having at least one monthly immunization session.

Category-b: Inhibition with less than 1000 population and within 1 mile distance from monthly immunization site.

Category-c: Inhibition with less than 1000 population but more than 1 mile away from monthly immunization site having at least quarterly immunization session or four session in succession during the period of easy accessibility.

District estimate for accessibility was calculated by doing average of figures of individual Sub centers in percentage. The value obtained in this exercise was 96.4% for the Surat district.

3. Utilization

The utilization of service, i.e. vitamin A1 was taken as the utilization. Since vitamin A1 is given with measles, less than 1-year population, which is one third of the target population, was taken as the denominator for utilization.

Adjusted utilization for district was calculated in 3 steps.

1) First Vitamin A1 coverage at individual PHC was averaged. It was 111.3%.

2) Then, Correction factor was calculated in two stages from validation at Sub Centres. First, by validation of entries reported in form-6 for number of children received Vitamin A1 from their registers at Sub Centre and secondly by validation of actual service received in the field. Thus the value of correction factor during this exercise obtained was 0.84.

3) Finally, the averaged Vitamin A1 coverage was multiplied by correction factor to get adjusted utilization for district. The adjusted Utilization for Surat district calculated was 93.4%.

Discussion:

Availability of Vitamin A was calculated separately and it was 79.6%. Data validation of Surat district report 2006 reported the availability for Vitamin A supplements for the district was 64.9 %.[4] Accessibility estimates by this study was 96.4% as calculated by doing average of figures of individual Sub centres. Previous data validation of Surat District estimated 97.5% accessibility by doing average of figures of individual Sub centres[4].

Vitamin A coverage at individual PHC was 111.3%. After calculation of coverage factor 1.0, the adjusted Vitamin A coverage was 93.4% in this study. Previous data validation of Surat District reported Vitamin A coverage of 115.1% and with correction factor of 0.85 the adjusted Vitamin A coverage of 98.1%[4]. MICS 2006[5] of Surat District reported Vitamin A coverage of 68.2% and MICS 2011[6] of Surat District 61.8%.

This study find out the adjusted coverage for district was calculated by multiplying correction factor for quality, which was 0.84 and adjusted adequate coverage which was 93.4%. Previous data validation of Surat District reported the adjusted adequate coverage of 98.1%[4] So, validation of data with the Modified John Hopkins methodology leads to find out the adjusted utilization of various RCH indicators.

Limitation of Study:

Surat district indicators like CBR, IMR and Proportion of home deliveries were used as baseline data for calculation of availability, accessibility, utilization and adequate coverage of Vitamin A supplementation for poor performing blocks of Surat district which may not be same for poor performing blocks of Surat district.

Recommendations:

1. During this exercise, client satisfaction was very high among those who have received service. It

reflects that wherever the services are being provided, there was no problem regarding client satisfaction.

2. At some PHCs, the records regarding supply of vitamin A did not match with the number of beneficiaries of vitamin A solution; no. of beneficiaries surpassed the supply. On further enquiry, it was found that vitamin A was supplied directly at the site by BHO during campaign and its entry was not made in the PHC register. To solve this problem, each entry must be made in the register of the vitamin A supplied at the site during six monthly campaigns.

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Short Communication
"Gender Gap": Where are we..?

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In India, sex ratio becomes a most important issue in recent Indian demography because of its worst condition.[1] 'Better Rs 5000/- now than Rs 5 lakh/- later' i.e. its better to spend Rs 5000 now to get rid of the female infant than to spend Rs 5 lakh in her dowry. With the birth of the female child, parents undergo a mixture of emotions, which includes happiness of adding a new member to the family as well as worry to collect dowry at the time of marriage. Discrimination is more evident in so called well educated and prosperous society. For example in some of the district of Haryana, Punjab sex ratio in 0-6 age group is even below 800 for every 1000 males. For this reason North- Western States of India i.e. Haryana, Punjab and Himachal Pradesh are called by some as 'Bermuda Triangle' i.e. the triangle where girls vanish.[1,2]

In 1871, when India held its first census, there were 5.5 million fewer females than males.[3] One hundred and twenty years later, in 1992, Amartya Sen estimated a deficit of 37 million females in India, drawing attention to the ''missing women'' of South Asia.[4] Some 10 million female fetuses are estimated to have been aborted over the last two decades in India.[5]

Due to discrimination against females, particularly female children, relative to males, in the allocation of food and health care within the household, There is a excessive mortality of females has been occurred.[6]

Though use of the new technology and advances are wide spread in all social sector but it is more in the well-educated and well off society. In a study conducted by Voluntary Health Association of India (VHAI) in the States of Punjab, Haryana and Himachal Pradesh, it was suggested that though use of sex selective abortion techniques were facilitated by their easy access to the medical facilities and good road network, but more determining factor was their paying capacity for the procedure[7]. Deficit for the girls in the second and third order child was more evident among women who were either educated beyond primary school level or from upper income group and not engaged in any economic activities[3,4,,8] Demographic imbalance created because of the declining sex ratio in India is a cause of concern to policy makers, implementers, demographers and social reformers.[4]

According to UN report 2010[9], "The World's Women", ratio of women per 1000 men is highest in Europe & North America region (1050), then Caribbean region (1030), Sub Saharan Africa (1020), Central Asia (1020), South East Asia (1000), India (940) & China (920).

Table 1: Demographic information:

	India (in crore)	Gujarat (in crore)
Population	121.0	6.03
Males	62.4	3.14
Females	58.6	2.89
Deficient of women in year 2011	3.8	0.25
Sex ratio (no. of women per 1000 men)	940	918

[Census 2011, provisional data, India]

There is large deficiency of women in India (3.8 crore) & in Gujarat (0.25 crore) (Table 1). Given the traditional preference for a male child[10,11,12,13], it is

not surprising that right from the first census of 1871, India has consistently shown an abnormal sex ratio (940 women for every 1000 men). Pregnancy-related morbidity and mortality account for 136,000 maternal deaths annually[14] and tend to further distort sex ratios. A steep decline in the sex ratio in recent years has coincided with an increased availability of ultrasound machines.[15,16] About 70% of all abortions performed in Delhi are terminations due to the foetus being female.[17]

Table 2: Districts of Gujarat where sex ratio decreased in 2011 census

No	Name of district	2011	2001	No. of decrease
1.	Kuchchh	907	942	35
2.	Amareli	964	987	23
3.	Surat	788	810	23
4.	Rajkot	924	930	6
5.	Bhavnagar	931	937	6
6.	Jamnagar	938	941	3
7.	Junagadh	952	955	3
8.	Mehsana	925	927	2

[Census 2011, provisional data, India]

Table 3: Districts of Gujarat where sex ratio increased in 2011 census

No	Name of district	2011	2001	No. of increase
1.	Banaskantha	930	936	6
2.	Patan	932	935	3
3.	Sabarkantha	947	950	3
4.	Gandhinagar	913	920	7
5.	Ahmadabad	892	903	11
6.	Surendranagar	924	929	5
7.	Porbandar	946	947	1
8.	Anand	910	921	11
9.	Kheda	923	937	14
10.	PanchMahals	938	945	7
11.	Dohad	985	986	1
12.	Vadodara	919	934	15
13.	Narmada	949	960	11
14.	Bharuch	921	924	3
15.	The Dangs	987	1007	20
16.	Navsari	955	961	6
17.	Valsad	920	926	6
18.	Tapi	996	1004	8

[Census 2011, provisional data, India]

Table 4: Simple regression analysis was done to determine the nature of correlation and future trend of sex ratio in India and Gujarat.

	Regression Equation	Correlation coefficient
India	Y = 1599.26 + (-0.335) X	- 0.87*
Gujarat	Y = 1450.74 + (-0.261) X	- 0.84*

[Y = Sex Ratio, X = Year, * = p value < 0.05]

After the implementation of PC & PNDT Act, many of the districts in Gujarat showed increase trend in sex ratio however overall sex ratio is still less compared to National data (Table 3 Fig 1). Simple regression analysis was done to determine the nature of correlation and future trend of sex ratio in India and Gujarat which shows nagative correlation between year and sex ratio if current situation is not changed.

Implementation status of the PNDT Act:

In 1970, Pre-natal testing was introduced in India. The centre had partial ban on sex determination tests in 1976. But it was applied on the government facilities, not on the private ones. During 1977-1982, 78000 female foetuses were aborted in India[18]. In Bombay during 1982 -1987 [4] sex determination clinics increased to 248 and from 8000 abortions 7999 were female fetuses[18].

After that, the centre passed the Pre Natal Techniques (Regulation and Prevention of Misuse) Act in 1994 covering the entire country. The law came into the operation on January 1, 1996.The act was amended in the year 2003 to include sex-determination at pre-conception stage and action against advertisements promising a male child. The amended act received the assent of the President on the 17th January, 2003. The act is now called PC & PNDT Act (Pre-Conception and Pre-Natal Diagnostic Techniques (Regulation and Prevention of Misuse)Act as amended by Amendment Act of 2002. [3,19]

Figure : Correlation of sex ratio with time before and after implementation of PNDT Act 1971 in India and Gujarat
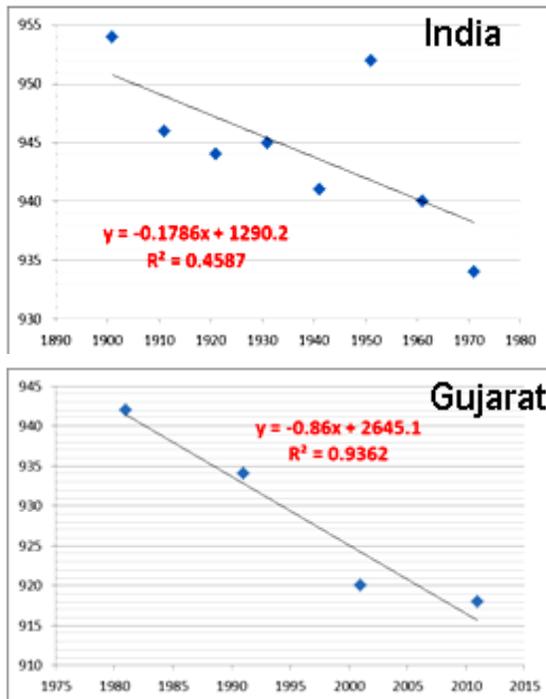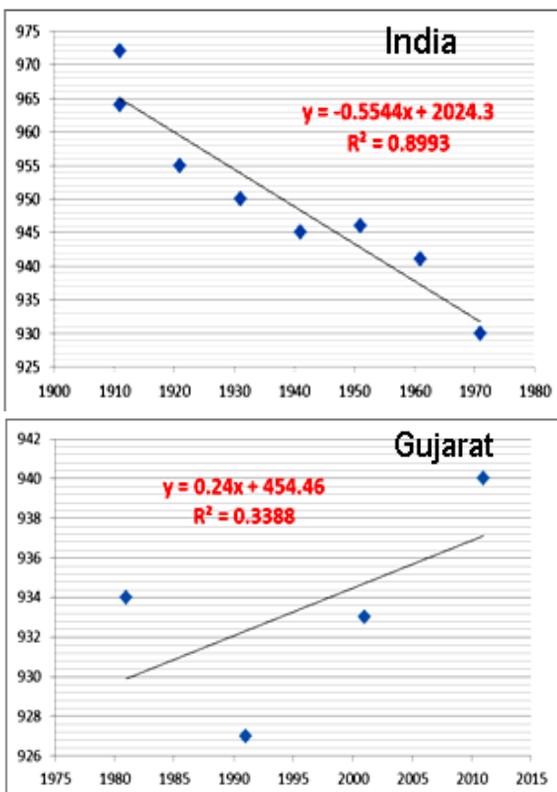
Before PNDT Act

After PNDT Act

Figure shows that, in India there is improvement in sex ratio after implementation of PNDT act but in Gujarat there is still decrease in the sex ratio.

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<u>**Short Communication**</u>

Profile of Infant deaths: Study of Three Years' Data at Rural Health Training Centre of AMC MET Medical College, Ahmedabad

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<u>**Abstract:**</u>

Background: Infant Mortality Rate (IMR) is one of the most sensitive indicators of health & one of the indicators for Millennium Development Goal on child survival. It is affected quickly & directly by the health programmes owing to its peculiar set of diseases & conditions.

Objectives: To study the profile, causes, trend of infant mortality and correlate them with various variables.

Methodology: It was a secondary data analysis conducted at Rural Health Training Centre, Jetalpur of AMC MET Medical College. Data were collected by studying the 'Infant death report forms' from the year 2008 to 2011. The variables of the format were entered in the Microsoft Excel and data was analysed.

Results: Total 65 infant deaths were reported during the study period.Infant mortality rates for 2008-09, 2009-10 and 2010-11 were 25, 20.8 and 24.5per 1000 live births respectively. Ratio of neonatal to post neonatal deaths was 4.3:1. Male: Female was 1.7:1. In about 4.9% deaths, place of delivery was home. In 80.3% of deaths delivery was full term while 19.7% were preterm. Caesarean section delivery was in 14.8%. Mean birth weight of the babies was 2.43 kg. Proportion of low birth weight babies was 49.05%. Most common cause of death was infection in about 24.5%. Other causes found were congenital abnormality, prematurity, foetal distress, asphyxia etc.

Conclusion: Though the target of IMR has been achieved, the high proportion of deaths during neonatal period points towards need to have better services during intranatal and neonatal period. Problem of LBW also requires to be taken care of.

Key words: Infant, Infection, LBW, Mortality, Neonatal, Prematurity

<u>**Introduction**</u>

Infant Mortality Rate (IMR) is one of the most sensitive indicators of health and living standard of a community. It quantifies the efforts directed towards mother & child health[1]. Death at this age is due to a peculiar set of diseases & condition to which adult population is less exposed. It is affected quickly & directly by the health programmes hence it changes more rapidly than general death rate[2].

Global scenario shows that IMR of developed nations is less than 10 per 1000 live births while that of underdeveloped nations is 90 and above[1]. As per SRS report, IMR of India is 42 per 1000 live births for 2012[3].However, there are regional as well as urban- rural differences in the IMR. For India, IMR of rural area is 46 & that for urban is 28 per 1000 live births. For Gujarat, it is 38 per 1000 live births with 45 & 24 in rural & urban area respectively[3]. As per the Millennium Development Goal-4 on child survival; target IMR for India is 27 per 1000 live births in 2015[4].

In developed countries, leading causes of infant deaths are congenital anomaly and anoxia while in developing countries they are Low Birth Weight (LBW) and infections which are largely preventable causes. In India, the causes of infant mortality includes LBW (57%), respiratory infection (17%), congenital

malformation (5%), diarrhoeal diseases (4%), birth injury (3%), cord infection (2%) and other causes (18%)[2].

With this background, the present study was conducted to study the profile of Infant deaths, the causes & trend of infant mortality and to correlate cause & time of infant death with various variables.

Materials & Methods

The present study was a secondary data analysis carried out at PHC Jetalpur which is Rural Health Training Centre (RHTC) of AMC MET Medical College which is about 15 kilometres from Ahmedabad catering population of 37,211 (2010-11).All the infant deaths which occurred in the field practice area from April, 2008 to March, 2011 were studied. Total 65 deaths were recorded during the study period.

For each infant death, 'Infant death report form' is filled up at all PHCs. So, for the above mentioned period, all such forms were collected from the RHTC. The numbers of infant deaths registered were 23, 19 & 23 during years 2008-09, 2009-10 & 2010-11 respectively. Out of these 65 deaths, 61 deaths could be studied. The variables of the reporting format were entered in Microsoft excel and data was analysed for means, proportions & difference between standard error of two proportions.

Results

Table 1 Age and Sex wise distribution of Infant deaths

Age	Sex		Total (%)
	Male	Female	
Within 24 hours	10	7	17 (27.9)
1 to 7 days	16	6	22 (36.0)
8 to 28 days	5	5	10 (16.4)
>28 days	7	5	12 (19.7)
Total	38 (62.3)	23 (37.7)	61 (100.0)

of which there were 38 (62.3%) males & 23 (37.7%) females. The difference was statistically significant (p <0.001). Neonatal deaths were 49 (80.3%) and rest were post neonatal. The difference between the two was statistically significant (p <0.001). There were 39 (63.9%) deaths in the early neonatal period. There was no significant difference between sex of the infant and time of infant death (p >0.05). (Table 1)

In about 5% deaths, place of delivery was home while in the rest, it was institutional delivery. Birth was by Caesarean Section (CS) delivery in about 15% of infants & in rest 85%, it was by vaginal delivery. In about 20%, delivery of the infant was Preterm. (Table 2)
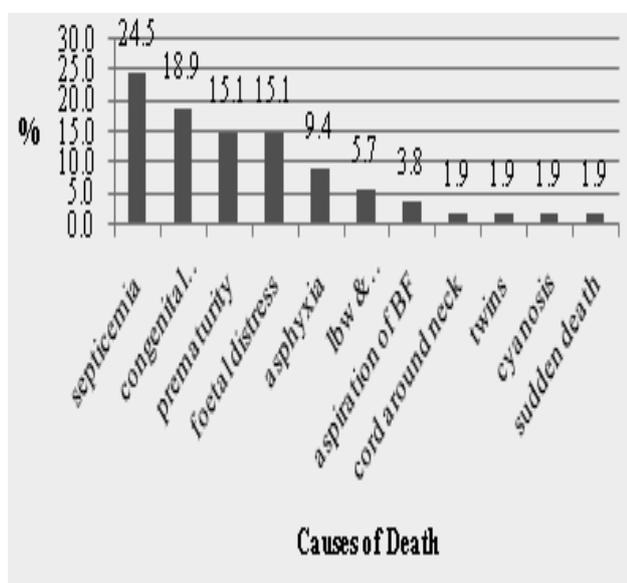
Table 2 Details of Delivery

Variable	Number (N=61)	%
Place of Delivery		
Home	3	4.9
Hospital	58	95.1
Type of Delivery		
Full term	49	80.3
Pre term	12	19.7
Mode of Delivery		
Vaginal	52	85.2
Caesarean Section	9	14.8

Mean birth weight of the babies was 2.43 ± 0.69 kg. Proportion of low birth weight (LBW) babies was 45.9% (28/61) of which 72% were full term babies. In males, the proportion of LBW was 42.1% (16/38) while in females; it was 52.2% (12/23). However, the difference was not statistically significant (p>0.05). 92.8% of LBW babies (26/28) died in neonatal period as compared to normal weight babies, of which 69.7% (23/33) died during neonatal period (p<0.05).

In 8 forms, cause of death was not mentioned. Most common cause of infant death (n=53) was infection /sepsis /septicaemia in about 24.5% followed by congenital abnormality (18.9%), prematurity (15.1%) & foetal distress

(15.1%). Other causes found in descending order, were asphyxia (9.4%), LBW & malnutrition (5.7), aspiration of breast feeding (3.8%) and cyanosis, cord around neck, twins & sudden death each in 2.0% (Figure 1). Causes of neonatal deaths (n=44) in descending order were congenital abnormality (20.5%), foetal distress (18.2%), prematurity (15.9%), infection/sepsis (15.9%), asphyxia (11.4%), aspiration (4.5%), LBW (4.5%) and cyanosis, cord around neck & twins each in 2.3%.

Figure 1 Causes of Infant Deaths (n= 53)

Causes of Death

Live births for the years 2008-09, 2009-10 and 2010-11 were 920, 915 & 937 respectively and infant mortality rates for these years were 25, 20.8 and 24.5 per 1000 live births respectively with no significant difference (p>0.05).

Discussion:

In the present study, out of 61 infant deaths, more than 60% were males. Around 80% deaths occurred in Neonatal period which was higher as compared to study by M. Salman et al in Aligarh[5] & a systematic review in India by Lahariya C et al[6], which showed contribution of neonatal deaths amongst infant deaths as about 60% & 48.5% respectively.There was no significant difference found between sex of the infant and time of infant death. However, M. Salman et al found higher female deaths in both the periods[5].

In the present study, most common cause of infant death was infection /sepsis/ septicaemia in about 24.5% followed by congenital abnormality (18.9%), prematurity (15.1%) & foetal distress (15.1%) with overall, proportion of LBW in the study was 45.9%. A systematic review in India showed that, amongst infants, sepsis/pneumonia, asphyxia, and prematurity/LBW remain substantial causes of deaths[6]. In a study in Delhi, 22% of infant deaths were attributed to diarrhoea, 14% to birth asphyxia, 12% to immaturity, and 11% to respiratory infection[7].

In the present study, most common causes of neonatal deaths were congenital abnormality (20.5%), foetal distress (18.2%), prematurity (15.9%), infection/sepsis (15.9%) and & asphyxia (11.4%). While the study by M. Salman et al found the major causes of deaths during the neonatal period were birth asphyxia (40.9%), prematurity (including LBW) (27.27%) and pneumonia, diarrhoea, tetanus, neonatal sepsis, neonatal jaundice & congenital malformation 4.55% each[5]. A systematic review on causes of child deaths in India showed that the median percentage of causes of deaths in neonatal period were sepsis/pneumonia: 24.9%; asphyxia: 18.5% and pre-maturity/LBW: 16.8%[6].

IMR in the study area for the year 2008-09, 2009-10 and 2010-11 were 25, 20.8 and 24.5 per 1000 live births respectively which is consistently lower than the national & state average[3]. However, no definite trend of reduction was seen.

Problem of LBW in full term delivery requires to be taken care of being an important determinant of neonatal /infant mortality. Training and retraining of the staff is required for proper filling of

reporting forms mainly mention of cause of death as per MCCD.

Limitations

Being a secondary data analysis, only variables & information provided in the formats could be studied.

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Activities

In pursuing the goal and objectives of the IAPSM-GC, the organization is carrying out different activities like annual conferences, training & capacity building, exposure visits, research, Monitoring & Evaluation, PG meets, PG Study Support Progams and many more innovative and academically productive ventures. It also felicitates distinguished personalities in the field Community Medicine field/Public Health who are our "guiding angels". Orations are organized for encouragement of the young budding experts in the field and many awards are also constituted as incentives.

<u>Short Communication</u>

Introducing Concept of Thematic Village Health and Nutrition Day in Gujarat State- An Experience towards a Step Forward

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Abstract

Village Health and Nutrition Day (VHND) is one of the key strategies for promotion of reproductive & child health. Because of comprehensive package of health and nutrition services, it is very challenging to convey all messages to the beneficiaries on the same time. It makes more sense to give extra emphasis on relevant key messages based on one chosen theme during VHNDs.

To introduce the concept of thematic VHND, diarrhoea prevention and management was chosen as a theme. The convergent action plan and detailed guideline for implementation was developed and the implementation of the same was concurrently monitored.

Thematic VHND was observed in 69% of the monitored sessions, in varying degrees, across the state. Based on the experience, it is feasible to conduct such sessions during VHNDs taking relevant themes and can be considered as an effective strategy for delivering health messages at mass level. Communication gap at various levels was the main reason for non celebration of thematic VHND and owning the programme by district managers was the most important reason behind the success of the initiative.

Key-words: Village Health and Nutrition day (VHND), Mamata Divas/ Mamata Abhiyan, Thematic, Gujarat

Background

Village Health & Nutrition Day (VHND)[1] is one of the strategies for promotion of reproductive & child health in India and is the key component of *Mamta Abhiyan*[2] in state of Gujarat, commonly known as *Mamta Diwas*, conducted mainly as outreach activity. Based on the Valsad district pilot experience supported by UNICEF, Government of Gujarat scaled up *Mamta Abhiyan* in the state[3] and average 33000 VHND sessions are held every month across the state[3] at Anganwadi centre or Sub centre in a village usually on Wednesday[1] as per micro plan prepared for this purpose. Health & ICDS functionaries provide health and nutrition services to all children under five years of age, antenatal & post natal mothers and adolescent girls[3].

It provides good opportunity for reaching unreached and for social inclusion. It is also a good platform for health education and behavior change communication. Comprehensive package of health and nutrition services, makes it challenging to convey all messages to the beneficiaries on the same time. It makes more sense to give extra emphasis on one key message per month during VHND. This led to conceptualization of celebrating Thematic VHNDs choosing relevant theme appropriate for the month based on the health problem, prevalent during that period like diarrhoea during monsoon, pneumonia during winter etc.

Selection of theme: The thematic VHND was conceptualized in the month of May 2012 and diarrheal episodes are known to reach the peak during months of June- July in India. Moreover, diarrhoea is a major public health problem accounting for 13% of the under five deaths [4] and more than 80% of these deaths are preventable with available interventions[5]. The major challenges for control of diarrhoea are low

ORS & zinc use rate[6], poor feeding practices[7], poor availability/use of safe drinking water and sanitation facility[6] and lack of awareness & poor practice of hygiene i.e. hand washing at critical times[7].

Considering all these facts, the concept of the thematic VHND was introduced taking theme of Diarrhoea Prevention & Management to spread awareness on the issue and to suggest & recommend implementation of the concept based on the findings.

Methods

Following Process was followed for Introducing Concept of Thematic VHND (Figure 1).

1. Conceptualization

In coordination with concerned sections of UNICEF state office, concept note for conducting Thematic VHND on Diarrhoea Prevention &Management was prepared by health section. It outlined the roles and responsibilities of each department involved, activities to be carried out with timeline and execution of the same, which was shared with the concerned departments of Government for their feedback and agreement.

2. Getting Consensus & Planning

Convergent action plan was developed in close coordination with all the concerned departments to reduce diarrhoea risk among under five children through Thematic VHND strategy. The detailed guideline was prepared outlining the activities to be carried out for observing thematic VHND in addition to regular VHND activities at the session site, materials required for the same, when to do these additional activities during the session, who will be the beneficiaries and who will be the service providers.

3. Communication

3A. Communication from line departments to District & Block level officers

The official letter for the celebration of thematic VHND on Diarrhoea Prevention & Management was issued from the state health department to the districts mentioning the concept and the selected theme along with the detailed guideline.

3B. Satcom

Using Satcom (satellite communication) facility available in the state of Gujarat, the message of Thematic VHND was communicated up to all frontline functionaries of health and ICDS in all districts. The key objectives were dissemination of the message of celebrating thematic VHND on diarrhoea prevention & management with the rationale behind and providing the service providers with the guidelines for thematic VHND celebration including activities to be carried out, logistics required and work distribution of all the functionaries.

Officials from Government departments and UNICEF participated in the panel discussion. To effectively pass the messages, power point presentation and video clip developed by UNICEF in local language was used. It provided opportunity for the interactive session as the questions were invited from the field by displaying toll free number and all the queries were addressed by the experts in the panel.
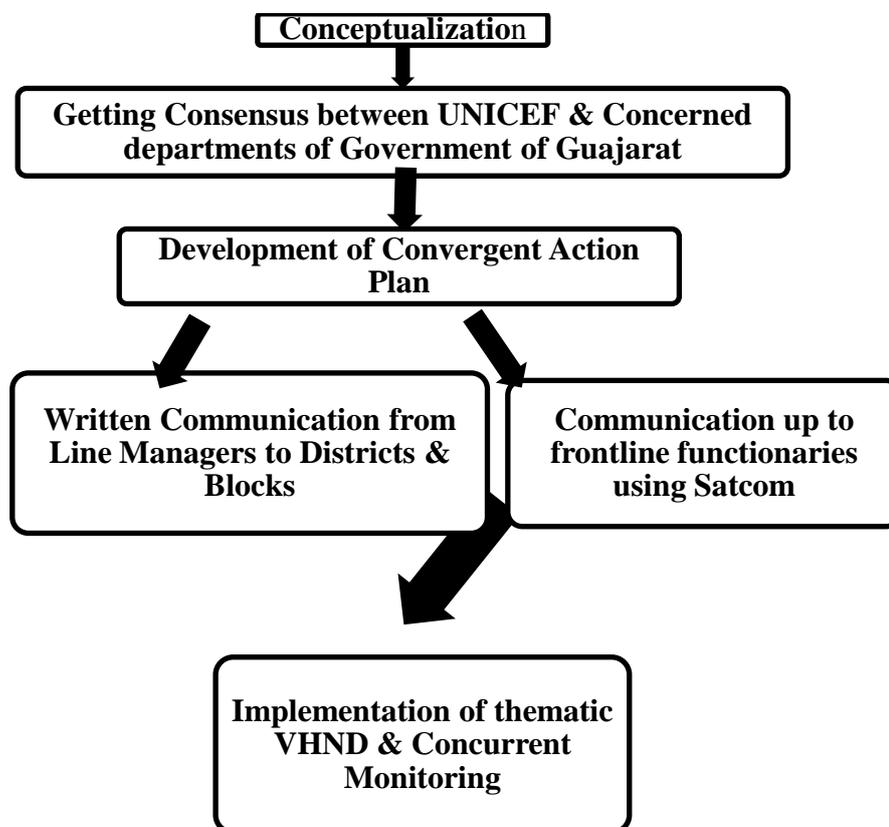
4. Concurrent Monitoring

Concurrent monitoring of thematic VHND was carried out by Government officers (RCSOs- Regional Child Survival Officers) & UNICEF consultants from concerned departments using pre designed structured tool. Total 51 sessions were monitored across 16 districts out of total 26 districts of the state. Data analysis was done using Microsoft Excel.

Results

Thematic VHND was observed in varying degrees across the state from hundred percent celebrations in district to partial to nil celebration in others. Thematic VHND was observed in 68.6% [95% CI 0.55 -0.80] (35/51) of monitored sessions. Of which, in 37.1% (13/35) of

Figure 1: Process of Introducing Concept of Thematic VHND

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                    │   Conceptualization      │
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        │ Getting Consensus between UNICEF & Concerned   │
        │ departments of Government of Guajarat          │
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              │ Development of Convergent Action  │
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    │ Written Communication    │   │ Communication up to       │
    │ from Line Managers to     │   │ frontline functionaries   │
    │ Districts & Blocks        │   │ using Satcom              │
    └──────────────────────────┘   └──────────────────────────┘
                    │
                    ▼
              ┌──────────────────────────────────┐
              │ Implementation of thematic        │
              │ VHND & Concurrent                 │
              │ Monitoring                        │
              └──────────────────────────────────┘
```

sessions, it was celebrated and made possible only because of special efforts of the monitors. (Figure 2)

Reasons for non celebration of Thematic VHND (n=29)

The most common reason found was non awareness about the same in more than two third of cases (67.7%) indicating communication gap. Other reasons were non availability of required logistics (12.9%), front line workers busy in other activities of VHND (12.9%) and presence of only few beneficiaries at the session (6.5%).

Details of the thematic VHND sessions held (n = 35)

Logistics Availability at the sessions: Most of the logistics required for celebration of thematic VHND were available at most of the session sites i.e. ORS sachets in 100%, spoon and glass in

91.4%, soap, drinkable water & one liter water jugin88.6%.The least available logistic was zinc tablet/syrup only in 28.6% sessions because of no state supply except in four districts where Diarrhoea Alleviation through Zinc & ORS Therapy (DAZT) project was being implemented. The other concerns were non availability of chlorine tablet (65.7%) & ladle (57.1%) in more than half of the session sites.

Activities observed during the Thematic VHND sessions: Out of pre decided key activities for thematic sessions, correct method of hand washing was demonstrated in 97.1% of sessions followed by demonstration of ORS preparation and use in about 82.9% of sessions. However, few sessions did demonstration of use of chlorine tablet (45.7%) and zinc tablet (40.0%) owing to lesser availability of both the things.

Figure 2: Celebration of Thematic VHND in the monitored sessions

Counseling topics covered during the Thematic VHND Sessions: In about 57%
        Thematic sessions, various counselling topics on diarrhoea were covered. Most common topic which was covered was hygiene and safety in 60% followed by feeding during diarrhea (57.1%), use of safe drinking water (54.3%), danger signs of diarrhoea (48.6%) and referral during severe diarrhoea (40.0%). Very few (about 3%) covered home based care in diarrhoea, causation and consequences of diarrhoea.

IEC material displayed at the sessions:
        65.7% of the thematic sessions displayed various diarrhoea related IEC materials i.e. banner, posters, pamphlets, exhibition panel, flip charts, flash cards.

Human interest stories from one of the Thematic Sessions:
        The beneficiaries were found happy following the talk of ANM on diarrhoea prevention & management. They expressed their feeling saying "it is good for Children and if such talks are arranged further, they will be happy to participate".

Discussion
        Thematic VHND provide Good opportunity (1) for inter- sectoral convergence to work for diarrhoea control, (2) to make community aware and to sensitize health care personnel about an
        important but forgotten killer of childhood i.e. diarrhea, (3) to promote use of ORS and Zinc for childhood diarrhea management and (4) to promote other health behaviors i.e. breast feeding, hand washing at critical times, using safe drinking water
        The sessions where thematic VHND was not celebrated, the reason at most places being non awareness about the same amongst medical officers of PHC and frontline functionaries. When they were made aware, they showed enthusiasm to celebrate. Communication at each level is of prime importance as communication gap at various levels was the main reason for non awareness about the thematic VHND at the field level which limited large scale implementation of this initiative.
        Ownership by the district health managers played important role for the success of this initiative and made big difference. Initiatives taken by the districts

for successful implementation in the field like organizing meetings at district/block levels to orient staff for thematic VHND, issuing letter to all PHC MOs to ensure availability of all logistics required for celebrating thematic VHND and developing separate formats for reporting of the activities of thematic VHND sessions.

Based on the experience, of celebrating Thematic VHND on Diarrhoea Prevention & Management; it is feasible to conduct such sessions during the VHNDs and it can be considered as an effective strategy for delivering health messages at mass level using the available resources. Similar Thematic sessions can be thought of for other health problems like ARI/Pneumonia control during winter months, Malaria during rainy season and also for healthy behaviors like breast feeding/complementary feeding during August-September, newborn care during another month.

Acknowledgements

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A matrix for Role of Epidemiologist and Public Health Manager in different epidemiological situation of diseases.			
		Etiology(Dynamics of Disease Transmission)	
		Known	**Unknown**
Prevention and Control Measures	**Known**	Epidemiologist : + Public Health Manager : ++++	Epidemiologist : +++ Public Health Manager : +++
	Unknown	Epidemiologist : ++ Public Health Manage : ++	Epidemiologist : ++++ Public Health Manager : +

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