

HEALTH SEEKING BEHAVIOUR IN A TRIBAL SETTING

Meerambika Mahapatro* and A.K.Kalla**

ABSTRACT

A total of 621 Bhattara women from 473 households of six revenue villages were studied. The results confirm that 'quick therapy' is considered as a part and parcel of allopathic system among tribals. However, for any kind of illness, Bhattara women used home remedy on priority basis. It was also observed that tribal women were not against the use of modern allopathic treatment in spite of the prevalence of the extensive use of traditional treatment. Interestingly, though their work output reduced significantly during their illness, they were not used to take bed rest, unless they were seriously ill. Since they believe that measles (gundi) and chickenpox (maa), occur due to the wrath of the Goddess (thakurani) on the patient, they visit the 'desari' rather than a medical practitioner.

In the tribal society, individual as a part of the society belongs to the collective etiology of illness and cure and as a patient reviews the efficacy of the healer as well as the system, In other words, a patient 'shops around' the healers for different kinds of therapy. The dichotomy of the preference for allopathic pattern is more cultural specific.

The study was conducted in six tribal villages of Nabrangpur district, Orissa. The villages were selected on the basis of accessibility of health services and other facilities. These revenue villages are Kosagumuda, Santostipur, Chelipadar, Junapani, Bajragada and Majhiguda. *Bhattara* is the most predominant tribal population of these villages. Though all the six villages are situated closely, yet they lack any transport network. The unit of study was ever-married women of each household. All the households of six villages were covered. A total of 621 *Bhattara* women from 473 households were studied.

*Assistant Research Officer, Department of Population Genetics and Human Development, NIHFV, New Delhi-110 067.

** Professor, Department of Anthropology, University of Delhi, Delhi 110007.

Infrastructural facilities such as drinking water, drainage and roads are very poor in this area. The hand pumps/taps are not enough to meet the needs of all the people, because water is supplied for 2-3 hours in the morning and evening respectively. Especially in summer, the supply of drinking water is scarce, so the people have to use river water. The situation gets worsened when the handpumps/taps are not repaired or go dry. The water accumulates near the handpumps/taps-because of improper drainage system and provides breeding grounds for mosquitoes. There was no electricity supply to the houses of the *Bhattaras*.

In 1991, during rainy season, about 500 people of Kosagumuda died of gastroenteritis, though only 10 cases were reported officially and were published in the newspapers. Mr. Radhakanta of Kosagumuda reported that the content of florine in the water is very high which might have affected the health of the people. Because of this, deep tubewells are dug to avoid diseases, due to excess proportion of florine in the water, is indeed a good strategy to reduce morbidity and mortality, since the villagers extensively use water from the tubewells. However, it was observed that in some cases, the parts of tubewells were stolen rendering them useless.

In PHC of Kosagumuda, there were four posts of doctors including specialists. At the time of the study, one doctor was in position. The doctor had to go on a tour for 19 days and he used to visit the village once in a month. During this period, the pharmacist or the compounder is the in-charge of the PHC which is found to bring poor reputation to the PHC.

Causes of Morbidity

Almost all the women reported to be sick during 1995-96. A high percentage (23.4%) of gastroenteritis was reported (Table 1). While almost 22 per cent and 17 per cent suffered from fever and respiratory infection respectively, 14.6 per cent complained of old age pain (old age is considered 50 years and above by the *Bhattara*), 0.2 per cent each found to suffer from leprosy, and whooping cough respectively. 2.1 per cent reported weakness due to sterilization. 17.5 per cent of the women reported gynaecological problem. For the diagnosis of the above ailments, help was taken from the doctors at the PHC.

TABLE 1
DISTRIBUTION OF CAUSES OF MORBIDITY AMONG THE WOMEN

SI No.	Morbidity	Women N	%
1	Gynaecological complaints	108	17.4
2	Tuberculosis	7	1.1
3	Leprosy	1	0.2
4	Old age complaints	90	14.5
5	Goitre	3	0.5
6	Anaemia	3	0.5
7	Scabies	5	0.8
8	Gastroenteritis	132	21.3
9	Fever	138	22.2
10	Cataract	5	0.8
11	Respiratory infection	107	17.2
12	Whooping cough	1	0.2
13	Weakness due to sterilization	13	2.1
14	Others	4	0.6
15	Not reported of any kind of disease	4	0.6
Total		621	100.0

Use of Available Health Facilities

For any kind of illness, *Bhattara* women used home remedy as the first preference of treatment. It is clearly observed that almost 49 per cent of the women used traditional measures of treatment, 45 per cent of the women were using all types of treatment including allopathic treatment available in their area and 6 per cent of them exclusively resorted to allopathic treatment (Table 2). This shows that the tribal women were not averse to the use of modern allopathic treatment despite the prevalence of the extensive use of traditional treatment. This appears to be a silver lining on the horizon of health management in this population. Adequate and sustained modern health facilities are thus expected to make a head way in this section of population. The present data also seem to support the observation made by Klienman that, Villagers prefer modern drugs which are easy to obtain, easy to take and fast in their effect.

TABLE 2
DISTRIBUTION OF PLACE OF TREATMENT

Sl. No.	Treatment	Women No.	%
1.	Allopathy (Pvt/PHC)	37	6.0
2	Traditional	306	48.9
3	All types of remedies	278	45.1
Total		621	100.0

The sick *Bhattaras* generally did not give necessary bed rest to themselves during illness and at the same time, their work out put reduced significantly. They took rest only when they were seriously ill. For the first two days of their sickness, they tried to take certain precautions like keeping check on their diet and taking home based remedy. Generally they tried to 'take out the evil spirit from the body of the sick person which was done by the old lady of the family or neighbourhood. They generally believed that the cause of all illness was evil spirit. If the illness persisted after having taken home based remedy, they visited the *desari*, the local medicine man. Local medicine man comes when he is offered one chicken, rice and vegetables for performing rituals to get rid of the evil spirit possessed by the sick man. It was a symbolic offer to satisfy the spirit of the sick person.

In case of *gundi* (measles) and *maa* (chickenpox), the sick persons used to go to *desari* and tried to satisfy the evil spirit. Therefore, no medical treatment was thought to be necessary by the people in these cases. According to them, measles and chickenpox are nothing but a form of wrath of the concerned *thakurani* (Goddess) on the patient. The most desirable remedy for such type of illness was provided by the *desari*. But when the patient's condition goes out of *desari's* control then people would usually take the patient to the PHC. Surprisingly, if the patient is not cured after the treatment by the PHC, then he would once again be brought back to the *desari* for treatment. Thus a vicious cycle of treatment is generated, shifting the patient from *desari* to PHC and from PHC to *desari*, and so on, which is indeed not conducive to the health of the people.

The reasons for not seeking Government or private health care facilities by these tribal women have been set out in Table 3. The highest percentage (50 %) of women reported that because the doctors were not available at the PHC all the time, they did not resort to modern health facilities. Since women, had to go

for their daily routine work, they could not afford spending time waiting for the doctors during the day. Usually the patient visited the PHC with another family member, hence it was not only the patient who had to wait but also the other family member who accompanied her had to 'unnecessarily' sacrifice his/her daily earnings. They also complained that the doctor did not listen to them properly and even before they could complete their details about their illness, the doctor would make his/her prescription. The patients travelled long distances and waited for a long time before reaching the doctor, and the latter took a maximum of 5 minutes to give them a treatment, which did not satisfy the patient. They reported that either the doctor writes the prescription and asks them to purchase the medicine from the drug store or gives two 'coloured tablets' for any type of illness. The *Bhattaras* found the allopathic medicines to be costly and at times not effective (Table 3).

TABLE 3
REASONS FOR NOT SEEKING GOVERNMENT/ PRIVATE
HEALTH CARE FACILITIES

Sl. No.	Reasons	Women	
		N	%
1	Illness not serious	64	21.2
2	PHC far distance	22	7.3
3	Doctor not available all the time, cannot wait for the whole day, less time given by the doctor, two 'coloured tablets' prescribed which were costly and not effective	151	50.0
4	God's wish, doctor cannot do anything	34	11.3
5	Chronic illness not curable	8	2.6
6	Old age problem	23	7.6
Total		302	100.0

In emergency, people visited doctor's residence at night and paid rupees twenty-five per injection. During interviews, it was realized that most of the people would be satisfied if they were given an injection for the treatment of their illness. The *Bhattara* thought that a visit or two to the PHC should be sufficient enough for them to get cured. The restricted visits to PHC by the sick person might not be able to deliver the goods, but this was taken to be ineffectiveness of the medicine by the tribals. They do need to be properly educated about the significance of repeated visits to PHC till they recovered.

21.2 per cent of the women found that their illness was not serious and that it was curable by home based remedy or by traditional therapy and hence there was no need for them to go to the PHC. 11 per cent of the women believed

that the illness was 'God's wish' and nobody could do anything about it. They further believed that if the God is 'satisfied', then he will show the miracle and will cure the sick and hence it was not at all needed to go to the PHC. However, 7.6 per cent of the old women were of the opinion that old age health problems are natural and there was no point in wasting money on them. For 7 per cent of the women, it was the distance of the PHC that prohibited them from visiting it when they or their family members were sick (Table 3).

Children especially infants need special care and attention during illness. Children are more vulnerable to illness because its impact is more pronounced among them. Acute Respiratory Infection (ARI) was found to be high (35.2 %) among the children below 6 years of age (Table 4). About 29 per cent of children were found to suffer from diarrhoea. 13.5 per cent of children suffered from skin infection (which may be because of poor hygienic conditions). 19.2 per cent of children were found to suffer from fever, 1.1 per cent from T. B. and 1.4 per cent from anaemia.

TABLE 4
AGE-WISE DISTRIBUTION OF MORBIDITY AMONG THE CHILDREN BELOW 6 YEARS
OF AGE DURING 1995-96

Age in months	Diarrhoea		ARI		Fever		Surface infection		T.B		Others		No Problem		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
0-6	13	3.7	11	3.2	7	2.0	2	0.6	-	-	1	0.3	2	0.6	36	10.3
7-12	7	2.0	10	2.9	9	2.6	9	2.6	-	-	-	-	-	-	35	10.0
13-24	23	6.6	29	8.3	13	3.7	9	2.6	1	0.3	2	0.6	-	-	77	22.1
25-48	37	10.6	48	13.8	24	6.9	16	4.9	1	0.3	1	0.3	-	-	127	36.4
49-72	21	6.0	25	7.1	14	4.0	11	3.2	2	0.6	1	0.3	-	-	74	21.2
Total	101	28.9	123	35.3	67	19.2	47	13.9	4	1.2	5	1.5	2	0.6	349	100.0

Utilization of Health Services

The distribution of children treated at the PHC and those used traditional system of medicine are given in Table 5. The present study seems to indicate that the parents of almost 50 per cent of the children below six years of age had tried both allopathic as well as indigenous system of medicine for treatment of most illness. About 19 per cent of the children were not treated by any kind of therapy. However, some (1.8 %) feared losing the infant if he/she is given any injection at the PHC which prevented them getting their infants treated at the PHC. This was mainly because illness was not severe and did not require medical attention. 29.5 per cent of the children were treated by the local medicine man because they had a strong faith in traditional treatment.

Home-based remedy is used by all the parents at the onset of illness. The tribals of Kosagumuda village were found to seek medical care earlier than the tribals of other villages which may be because of the physical proximity of the PHC. The children were usually taken for medical care on the second day of the onset of illness while the elders especially, mothers, further delayed receiving medical care.

TABLE 5
AGE-WISE DISTRIBUTION OF UTILIZATION OF HEALTH CARE SERVICES
BY CHILDREN BELOW 6 YEARS OF AGE

Age (in months)	'Desari'		PHC and 'desari'		All types of Treatment		No treatment		Total	
	N	%	N	%	N	%	N	%	N	%
0-6	7	2.0	22	6.3	-	-	7	2.0	36	10.3
7-12	10	2.9	17	4.9	2	0.6	6	1.7	35	10.0
13-24	21	6.0	49	14.0	4	1.1	3	0.9	77	22.1
25-48	37	10.6	61	17.5	2	0.6	26	7.4	127	36.4
49-72	28	8.0	23	6.6	-	-	24	6.9	74	21.1
Total	103	29.5	172	49.3	8	2.3	66	18.9	349	100.0

Table 6 shows that the women (32.7%) were more active and independent in making their decision regarding the treatment of their children below 6 years of age, while, they were much concerned about their own health problems. They were prompt enough to take decision when the sickness of the child was concerned. The reason of high percentage of mothers, participation in making decision about child's health care may be that they too were being important earning members of the family. It would therefore, be quite useful to

further motivate these mothers who are found to be quite responsible for the health of their children.

TABLE 6
AGE- WISE DISTRIBUTION OF CHILDREN BELOW 6 YEARS OF AGE
REGARDING VIS-A-VIS THE DECISION MAKER FOR PHC TREATMENT

Age (in months)	Mother N	%	Paths N	%	Both N	%	Others N	%	Total N	%
0-6	6	3.5	4	2.3	12	7.0	-	-	22	12.8
7-12	8	4.7	3	1.7	6	3.5	-	-	17	9.9
13-24	12	7.0	16	9.3	19	11.0	2	1.2	49	28.5
25-48	17	9.9	20	11.6	19	11.0	5	2.9	61	35.4
49-72	13	7.6	6	3.5	3	1.7	1	0.6	23	13.4
Total	56	32.7	49	28.4	59	34.2	8	4.7	172	100.0

(for the rest of the children, women were silent and did not report)

A General View of *Bhattara* about Doctor, *Desari*, and Illness

According to a respondent of Santoshpur village, The PHC is situated very far from the village (about 4 kms) and the doctor is never available. A PHC doctor, therefore, could not be depended upon for treatment of illness at a time requiring immediate attention of a doctor. Treatment at the PHC is not much effective and drugs are not always available. The cost of medicine is very high and, therefore, the villagers are unable to avail of the Government health care facilities. Traditional healer or priest or locally called *desari* in the vicinity of the village is the first choice of treatment for any type of illness, because he is easily accessible to the villagers at any time. He is the decision-maker for the sick person about going to a PHC doctor or to continue with his treatment. The villagers feel that it is better to depend on traditional medicine, because it is easily available and it is potential enough to reduce the severity of the symptoms at the time of immediate need.

Another villager of Chelipadar said Children, especially infants, need special care and attention during illness. In this area, the children suffer more because parents are unable to devote adequate time to their care. During illness of the children, when they actually need mothers care, mothers are compelled to leave their children with the elderly women in the household or with the other relatives or neighbours as they have to go to work.

According to a respondent of Bajragada, Common causes of illness include severity of weather, poor environment, evil spirit and wrath of God.

Treatment from doctor is not necessary for most of the minor illnesses such as cold, cough and mild fever. These ailments tend to subside on their own and upon recovery there is no residual impact of illness. Home-based remedies reduce the severity of most minor illnesses. However, they go for allopathic treatment if their child is sick. For elderly persons, they take home remedy for treatment."

A native school teacher of Kosagumuda says, "The common cause of illness is poor sanitation. Women urinate in standing position at any place except their living rooms and also use the same clay for washing the utensils. After urination, she does not take bath. The second reason is that people do not have toilets for defecation and they use open field area. This field is also used for several purposes. Children play there, people collect *tentuli* (tamarind) which falls in the field from the tree and it is also used as a passage. Since people do not use foot wears, the germs generally enter through the feet. For cooking, people use 'Bhansuli' river water which is very dirty. Tap water is supplied in morning and evening hours, when the women are quite busy with other works and sometimes it is not supplied at all. As a result, they are forced to use the river water.

CONCLUSION

The first preference of treatment for any kind of illness was generally the *desari*, the local medicine man. The use of modern allopathic treatment was also resorted to and the *Bhattara* women were not averse to it. However, it is found that in the tribal society, whatever are the shortcomings of the medication, it is clearly observed that 'quick therapy' is considered as part and parcel of allopathic system.

यह अध्ययन छह गाँवों के 473 परिवारों में से कुल 621 भाटड़ा जाति की महिलाओं पर किया गया था। अध्ययन से प्राप्त निष्कर्षों से यह पुष्टि होती है कि आदिवासियों द्वारा एलोपैथी चिकित्सा प्रणाली को त्वरित उपचार पद्धति के रूप में देखा जाता है। भाटड़ा जाति की महिलायें किसी भी प्रकार की बीमारी होने पर घरेलू उपचार को प्राथमिकता देती हैं। यह भी देखने में आया है कि यद्यपि उनमें प्रारम्भिक उपचार पद्धति अधिक प्रचलन में है, फिर भी आदिवासी महिलायें आधुनिक एलोपैथिक चिकित्सा उपचार पद्धति द्वारा उपचार कराने के विरुद्ध नहीं हैं। बीमारी की हालत में यद्यपि उनकी कार्यक्षमता में महत्वपूर्ण रूप से कमी आ जाती थी, किन्तु वह बिस्तर पर रहकर आराम नहीं करती थीं, ऐसा वह गंभीर रूप से बीमार होने की स्थिति में ही करती थी, ऐसा वह गंभीर रूप से बीमार होने की स्थिति में ही करती थी। खसरा (गुंडी) और चेचक (माँ) जैसी बीमारियों से पीड़ित होने पर इलाज के लिए वह डाक्टर के पास जाने की बजाय 'देसारी' के पास जाती हैं, क्योंकि उनका विश्वास है कि ये बीमारियाँ दैविक प्रकोप (ठाकुरानी) के कारण होती हैं।

REFERENCES

- KLIENMAN, A (1988): *The Illness Narratives Suffering, Healing and Human Condition* Basic Books, *Harper Collins*, USA.
- SWAIN, S. (1994): *Health, Disease and Health Seeking Behaviour of Tribal People of India, Tribal Health in India*, (ed. S. Basu), *Manak Publications Pvt. Ltd.*, New Delhi.

PUBLIC HEALTH IN THE TWENTY FIRST CENTURY AND ITS ROLE IN DEVELOPING COUNTRIES

W. W. Holland*

ABSTRACT

Public health is an inter-disciplinary subject of both arts and science which the author feels, be strengthened in the countries of the third world. The author is also of the view that public Health cannot be isolated from other aspects like education, environment, industry, etc. Further, the author argues that public health practitioners must be given sufficient freedom to make the public health system more efficient and effective. As public health is a long-term process to produce its output, its budget should be protected from short-term emergencies of clinical care. Also, there should be no meddling of politicians and bureaucracy in the professional functioning of public health system. Medicos should be taught public health and its method of functioning by which outbreak of major public health problems in future could be averted easily.

Public health is the science and art of preventing disease, prolonging life and promoting health through the organised efforts of society¹. This definition is taken from a WHO document. Though it was written considering the prevailing condition in England, it can also be applied to all counties throughout the world.

Public health to function effectively, it must be able to assess what problems exist, and send feedback to those involved in that problem. It is crucial to recognise that public health influences and is affected by all sectors of society, not only by those involved in or in contact with the health system. Given this primary function, the public health system of all countries requires a system of surveillance, both to monitor the existing conditions as well as to identify when new problems arise.

*Emeritus Professor of Public Health Medicine, University of London, Visiting Professor (Health), LSE, London. WC2A2AE.

Once a problem has been identified, the public health service needs to identify appropriate methods for dealing with the same. It is crucial that this is not restricted only to health service action or health service practitioners but recognises that public health is involved in all social, environmental and other activities of populace. Thus, the activities of farmers in producing food or tobacco may be as crucial in influencing public health as the actions of physicians in providing preventive or curative services.

Obstacles

The major public health problems of the developing world at this time are due to infectious and nutritional diseases - theoretically, the benefits of public health activity are much more obvious and effective than in the developed world with problems of chronic diseases. But the real difficulties in public health action in all parts of the world are in implementation. An example of the difficulties of public health in the control of infectious diseases is provided by AIDS. In all parts of the world there has been far more emphasis on investigation of the virus and the molecular basis of the disease, its treatment and the development of a vaccine to prevent the disease. But, less attention is paid to the problems of understanding human behaviour, or the change in human behaviour. The emphasis has been placed on the tail-end of the disease process-on treatment -rather than at the beginning, on prevention.

Public health practitioners cannot act in isolation. They are always dependent on government at the central or local level, for the freedom, to practice effectively. It is crucial that the governmental bodies, at all levels, recognise the nature of the professional responsibilities for the public's health. Therefore, the public health practitioners must be given sufficient status to determine and execute appropriate health policies. But often, public health knowledge and wisdom goes counter to belief, and accepted practice. Thus they need support in fulfilling their task, even if it runs counter to the beliefs of the politicians, managers, administrators or the people. In many countries, public health professionals are rarely given responsibility for the improvement and maintenance of their population's health but are saddled with mundane bureaucratic tasks, much less demanding of the skills required to promote a population's health. Thus, as a result of political interest, often perceived by professionals as interference, the public health practitioner is unable to concentrate on the necessary priorities to devise appropriate solutions. They are often not helped by media attention, and subsequently, public opinion, as these are often manipulated to create cheap news items.

METHODS

To fulfil their role, public health practitioners must develop an agreed methodology, based on evidence, for tackling public health problems. Unless public health practitioners develop a competent, professional methodology, they are bound to have a relatively small impact on the improvement of public health. The difficulties that public health practitioners face are numerous, and the development of professional expertise is the only hope so that they can fulfil their expected role and contribute constructively to the improvement of public health policies.

No universal model of the detailed responsibilities of public health practitioners exists but the major tasks should be:

- (i) To assess the health status of the population;
- (ii) To evaluate and undertake necessary actions including health care needs;
- (iii) To determine the most appropriate way to satisfy the public health needs, including health care of individuals, groups and to assess the effectiveness with which those needs are met; and
- (iv) To identify specific health hazards, and to plan their containment.

Dissemination of information and research findings is an essential function of the public health discipline. To fulfill this role adequately, they have to be forthright in the advocacy of programmes that improve health and state clearly and openly the dangers and consequences of some actions - clinical environmental or political. In order to ensure that appropriate public health actions are taken, public health practitioners must have access to and to influence the budget for public health activities. It is important to recognise that this will always be controversial. Public health activity is long-term and thus, always suffers from the competition in funds for competing short-term emergencies and acute clinical care. Thus, ensuring an appropriate and adequate budget for public health is a major challenge, which, however, must be tackled if improvement in the health of the population is desired.

Furthermore, it is necessary for mechanisms to exist whereby public health practitioners have a clearly identifiable role in helping, influencing and

guiding the policies not only of health authorities, but also of schools, environmental agencies, welfare agencies, housing departments, microbiological laboratories and practicing clinicians in hospitals and communities.

Tasks

Thus, to summarise, public health has to be able to tackle four broad types of problems:

- (i) Outbreaks of diseases caused by infectious or toxic agents – for example, typhoid, cholera, food poisoning, malaria and radiation,
- (ii) Problems arising from social and environmental issues such as inadequate housing, water supply, nutrition, unemployment, poverty,
- (iii) Behavioural concerns such as smoking, excessive consumption of alcohol, drug taking, etc., and
- (iv) Health service issues such as assessment of health care needs and outcomes and the effectiveness and efficiency of particular services.

Training and Education for Public Health

From the above outline of the tasks which public health has to perform, It should be clear that this is a formidable agenda. The primary task of public health is to promote health and control disease. The major academic disciplines of public health are epidemiology, medical statistics and some aspects of the social sciences such as sociology, economics and psychology. These are uniquely combined in training public health practitioners. Public health is a multi-disciplinary activity in which practitioners work in teams, which is not so easy. This requires both training and fostering.

Public health practitioners to fulfill their major task in the promotion of health and control of disease, epidemiology is crucial. But, particularly for infective/toxic conditions, it is crucial that links are established with microbiological and toxicological laboratories. But they must have appropriate knowledge in these disciplines to be able to use their expertise to the best effect. Public health has key needs in the collection, analysis and dissemination, of accurate information. It follows that it should have a major role in the design and implementation of supporting information systems. It is important for the effective

monitoring of health needs and outcome that data collected about patients are linked to individuals and not merely based on events.

The importance of infections or toxic hazards in the emergence of diseases is universally accepted. But not all individuals exposed to a particular hazard succumb. There are a variety of biological, environmental, behavioural and social factors which play a part in the development of these diseases. The role of public health in finding way through the jungle of determinants of these diseases is an extremely complex one. Many of these factors are related inextricably to political, professional and economic realities. Their identification may well antagonise one interest group or other. Public health practitioners, therefore, require diplomatic, political and persuasive skills to achieve the most positive results. One task which public health neglects at its peril is the ability to communicate. Some health risks are the result of individual choices, others involve social issues, e.g. sex education of children at school. The ability to communicate with individuals, masses, politicians, administrators/managers and even with the media is a crucial skill which has to be learnt.

Public health obviously has to be accountable for its actions. One way of providing clear evidence of what has been achieved is the production of regular public reports. This should not be considered as merely a routine chore, but as a core activity of public health. The open publication of a report on public health issues tackled and those still requiring action can be a powerful tool in influencing the activities of both the populace as well as public bodies. This can be reinforced by regular analysis of progress on issues raised in the past reports.

Research

No subject can survive without an adequate base of research. Public health research, by its very nature, can provide an alternative to traditional research priorities, for example, by concentrating on conditions such as malaria which affects the population widely, as compared to 'interesting' problems such as metabolic disorders. In order to succeed this, a research strategy needs to be developed. It must include the gathering of intelligence on a broad front to determine the main national priorities. An appropriate research structure is necessary by which tasks can be appropriately tackled. This implies a proper manpower-development structure, with the involvement of educational institutions and government, and provision of adequate resources for such research.

Structure

For an adequate education of medical graduates in public health, the subject must be given appropriate prominence in all parts of the undergraduate curriculum. Public health is a bridging subject which can integrate the various aspects of medical education. It is essential that future medical practitioners have the ability to see community problems, and are able to appreciate the methods used in tackling public health problems. Medical schools world-wide rarely provide sufficient education in epidemiology or the numerical and social sciences required in public health to give their graduates even a superficial appreciation of public health problems. Unless medical schools provide more education on social and preventive medicine (SPM), it will continue to be difficult to attract suitably qualified doctors into this field.

Since the subject is multi-disciplinary, other members of the team ranging from nurses to statisticians or information specialists to health economists and environmental officers, usually have even less exposure to the fundamental subjects and principles of public health. It is therefore, essential to provide a locus, e.g. a school of public health, to provide the essential education for those persons who wish to serve in this field. Since both the problems of public health and the knowledge required to bring reforms over time, these schools or institutes must also have the responsibility for the continuing education and development of practitioners who have obtained the basic postgraduate education.

CONCLUSION

It is generally agreed that some level of public intervention is necessary to protect the health of the population. There must be a public health presence at the centre as well as at the periphery. Public health practitioners are required at all levels of a health system as they are concerned with the promotion of health and control of diseases. They must have access to more than health services, e.g. environment, education, etc. To enable to fulfill their role, as outlined, public health practitioners need to be well trained in the basic subjects, should have a clear career pathway and have freedom to both act and communicate their concerns to the population. It is essential to recognise that public health is a team activity and requires the co-ordination of individuals from a variety of disciplines. Public health usually is a long-term process to produce its result.

Lkkjk'k

लेखक का मानना है कि जन स्वास्थ्य, कला और विज्ञान दोनों का एक अन्तर —अनुशासनिक विषय है, अतः तीसरी दुनिया के देशों द्वारा इस कार्यक्रम को और अधिक सुदृढ़ बनाया जाना चाहिए। लेखक के मतानुसार शिक्षा, पर्यावरण और उद्योग आदि जैसे अन्य पहलुओं से जनस्वास्थ्य को पृथक नहीं किया जा सकता। लेखक द्वारा आगे यह भी तर्क दिया गया है कि जनस्वास्थ्य को और अधिक कुशल और प्रभावी बनाने के लिए जन स्वास्थ्य कार्मिकों को अपना कार्य करने में पर्याप्त स्वतन्त्रता दी जानी चाहिए। जन स्वास्थ्य, दीर्घकालीन प्रक्रिया होने के कारण, चूंकि बजट को संरक्षण प्रदान किया जाना चाहिए। जन स्वास्थ्य प्रणाली में राजनीतिज्ञों और अधिकारीतंत्र द्वारा हस्तक्षेप नहीं किया जाना चाहिए। डाक्टरों को जन स्वास्थ्य और इसकी कार्यप्रणाली संबंधी शिक्षा दी जानी चाहिए, ताकि वे भविष्य में सामने आने वाली जन स्वास्थ्य संबंधी प्रमुख समस्याओं को आसानी से हल कर सकें।

REFERENCES

1. Public Health in England (1988): The Report of the Committee of Inquiry into the future Developments of the Public Health Function (Acheson Report) HMSO.

EFFECTS OF PENTOXIFYLLINE AND CAFFEINE ON SPONTANEOUS MATURATION OF RAT OOCYTES

S. K. Chaube*, S. P. Chaki** and M. M. Misro***

ABSTRACT

The effects of two phosphodiesterase inhibitors (caffeine and pentoxifylline) and a membrane permeable analog of CAMP (dibutyryl- CAMP) on spontaneous maturation of cumulus-enclosed (CE) and denuded (Dd) oocytes were investigated in vitro. When the mechanically denuded oocytes were cultured in a hormone-free medium, a significant increase in the rate of oocyte maturation was recorded after 3 hrs of incubation ($47.67 \pm 9.08\%$) which was further increased to $83.53 \pm 2.77\%$ after 5 hrs of culture. The maximum rate of oocyte maturation was, noticed after 20 hrs of culture ($97.78 \pm 2.03\%$). On the other hand, the presence of cumulus cells encircling the oocytes significantly reduced the rate of maturation during initial period of incubations (3hrs, $9.09 \pm 4.95\%$: 5hrs, $32.11 \pm 8.14\%$). However, the inhibitory effect of cumulus cells on oocyte maturation was nullified following 20 hrs of incubation and the rate of maturation was similar to Dd oocyte group (Dd, $97.78 \pm 2.03\%$ versus CE, $90.15 \pm 2.79\%$). Similarly, during initial period of incubation, various doses of db-CAMP completely inhibited oocyte maturation but the inhibitory effect was observed dose-dependent after 20 hrs of incubation. Pentoxifylline or caffeine significantly reduced the maturation of CE and Dd oocytes but the later was found to be more potent. Caffeine (> 0.4 mM) completely inhibited oocyte maturation in CE oocytes, at all the

*Research Officer, Department of RBM, National Institute of Health and Family Welfare, Munirka, NewDelhi-110067.

**Research Assistant, Department of RBM. National Institute of Health and Family Welfare. Munirka, New Delhi-110067.

***Reader, Department of RBM, National Institute of Health and Family Welfare, Munirka, New Delhi-110067.

time points studied. Pentoxifylline mediated inhibition of CE oocyte maturation was dose-dependent following 20 hrs of incubation. In addition, 1 mM of both pentoxifylline and caffeine also reduced the rate of maturation significantly ($P < 0.001$) in Dd oocyte at all the time points studied. Taken together these results indirectly suggest that the cumulus cells delay the initiation of oocyte maturation probably by synthesis and transfer of CAMP to oocyte and that these phosphodiesterase inhibitors directly act at oocyte level to inhibit spontaneous maturation in vitro.

Resumption of meiosis (process of oocyte maturation), under normal conditions, is initiated in the preovulatory follicles in response to a surge of pituitary gonadotropins. It is also confirmed that meiotically competent oocytes cultured in a hormone-free medium *in vitro* undergo spontaneous maturation following their release from the follicular environment². The initiation of maturation *in vitro* is characterized by dissolution of germinal vesicle and nucleolus in the oocytes. Though the follicular association is important for maintenance of meiotic arrest in the oocyte, the role of follicular cells in the regulation of oocyte maturation *in vitro* is not well understood. It is reported that the maintenance of meiotic arrest is dependent on the integrity of the cumulus-oocyte complex which may allow continuous transfer of CAMP to the oocyte from the cumulus cells through gap junctions. The disruption of the communication link between the oocyte and cumulus cells may lead to a reduced flow of CAMP, insufficient to maintain the basal sustained level required to maintain the meiotic arrest. These and other reports have documented that the integrity of association of follicular cells is important in the maintenance of meiotic arrest. This is further supported by the fact that oocyte response to the inhibitory factors secreted by thecal cells can be partially augmented by increasing levels of CAMP in these cells. Thus, the involvement of cumulus cells in the maintenance of meiotic arrest may be due to synthesis and transfer of inhibitory levels of CAMP from cumulus cells to oocytes. The another possibility is that the cumulus cells may promote the production of inhibitory levels of CAMP within the oocytes.

The involvement of CAMP in the regulation of oocyte maturation has also been suggested through several *in vitro* studies using membrane permeable analogs of CAMP (db-CAMP and 8-bromc—cAMP) or agents that increase intracellular CAMP levels, such as cAMP-phosphodiesterase(PDE) inhibitors and adenylate cyclase activators, inhibit resumption of meiosis *in vitro*. Hence, it appears that an increase in the level of CAMP is associated with the

maintenance of meiotic arrest and its decrease is prerequisite for induction of oocyte maturation. Pentoxifylline and caffeine are extensively used to increase sperm motility in reproductive clinics world over. The present study is designed to test the effect of these two PDE inhibitors on spontaneous maturation of oocytes *in vitro*. The inhibitory effect of db-cAMP on spontaneous oocyte maturation was utilized as a positive control in these experiments.

MATERIALS AND METHOD

Animals- Immature albino rats, Holtzman strain, aged 24 days, were injected 20 IU of pregnant mare's serum gonadotropin (PMSG) peritoneally, in 100 of normal saline. The animals were housed in normal husbandry conditions and provided food and water *ad libitum*.

Chemicals- All chemicals used in the present study were tissue culture grade (Sigma Chemical Co., St.Louis, MO, USA). Working concentrations of pentoxifylline, caffeine (1, 3, 7-trimethylxanthine) and db-cAMP were prepared in culture medium from stock solutions immediately before use.

Isolation and culture of pre-ovulatory CE and Dd oocytes - Animals were sacrificed following cervical dislocation after 48 hrs of PMSG injection, ovaries were removed and cleared of fat and then transferred to a 35mm petridish (Falcon, USA) containing 2 ml of sterile culture medium. Briefly, follicles (> 0.8 mm diameter) were punctured with a sterile 22 gauge needle and the cumulus oocyte complexes (COCs) were collected, washed and maintained at 37°C in the culture medium. The culture medium consisted of medium 199, sodium bicarbonate 0.035 per cent (w/v), fetal bovine serum 10 per cent (v/v), penicillin (100 IU) and streptomycin (100 ug/ml). Dd oocytes were recovered by mechanically removing cumulus cells from COCs with the help of a small bore (dia.100 um) pipette. The average time for isolation and preparation for culture of CE and Dd oocytes was 6 + 2 min and 10 + 2 min, respectively. Following three washes in the culture medium, oocytes were transferred to 24 well culture plates (Corning, USA) containing 500 ul of the medium. Groups of 12 to 15 oocytes were maintained in each well and cultured in an incubator at 37°C in 100 per cent humidity with 5 per cent CO₂. Both CE and Dd oocytes were randomly assigned to various groups for the subsequent studies.

Spontaneous maturation in CE and Dd oocytes and effect of drugs- Effect of cumulus cells on oocyte maturation was studied at different time periods as per standardized protocols. In later experiments, using db-cAMP and

phosphodiesterase inhibitors, identical in vitro culture protocol was followed throughout the present study. As indicated, oocytes were washed three times and incubated with or without drugs for different periods (3,5 and 20 hr) following which they were examined under a phase contrast microscope to determine their maturational status. Mature oocytes were identified by the absence of germinal vesicle and expulsion of the first polar body. Since germinal vesicle breakdown is the first morphological change occurring, it was used as an end point for assessing the oocyte maturation.

Statistical Analysis

Each experiment was repeated a minimum of four times and data are expressed as means $\pm$ standard error of means (SEM). All the data were first transformed using arc sine-square root transformation. Arcsine-transformed data were analyzed either by Student's 't' test or one way analysis of variance (ANOVA).

RESULTS

Effect of cumulus cells on spontaneous maturation- The effect of cumulus cells on spontaneous maturation was evaluated by mechanical removal of cumulus cells from oocytes (Fig.1). Detachment of cumulus cells from oocytes (denuded oocytes) induced spontaneous maturation significantly ($P < 0.01$) at 3 hrs ($47.67 \pm 9.08\%$) and 5 hrs ($83.53 \pm 2.77\%$) of incubation when compared to the rate of maturation in CE oocytes at 3 hrs ($19.09 \pm 4.95\%$) and 5 hrs ($32.11 \pm 8.14\%$) of incubation respectively. The inhibitory effect of cumulus cells attachment to the oocytes was not noticed when the incubation period was prolonged up to 20 hrs (CE, $90.15 \pm 2.79\%$; Dd, $97.78 \pm 2.03\%$).

Effect of db-cAMP on spontaneous maturation- In the second set of experiments, the effect of various doses of db-cAMP on spontaneous maturation was investigated. Almost complete inhibition of maturation in CE oocytes was observed during early hours of incubations (3 and 5 hrs) at all doses (0.2,0.4,0.6 and 1.0 mM) of the drug used in the present study. However, following 20 hrs of incubation, a dose-dependant inhibition (one way ANOVA: $f = 56.92$, $P < 0.001$) in the rate of CE oocyte maturation was clearly evident (Fig.2).

Effect of pentoxifylline on spontaneous maturation- The effect of various doses of pentoxifylline on spontaneous maturation of CE oocytes is shown in fig.

3. Similar to the inhibitory pattern of db-cAMP, different doses of pentoxifylline (0.2,0.4,0.6 and 1.0mM) did not allow CE oocytes to initiate maturation during early hours of incubations (3 and 5 hrs). However, a dose-dependent inhibitory effect of pentoxifylline was seen when the oocytes were cultured up to 20 hrs (one-way ANOVA: $F=110.89$; $P<0.001$). Incubation of Dd oocytes with 1.0 mM pentoxifylline also showed a significant ($P<0.001$) reduction in the percentage of oocyte maturation at all the time point studied (Fig.4).

Effect of caffeine on spontaneous maturation- Fig.5 shows the effect of various doses of caffeine on spontaneous maturation on CE oocytes. Caffeine > 4.0 mM completely inhibited spontaneous maturation of CE oocytes-at all the time points when compared to respective controls. Although the lower dose of caffeine {0.2mM) did not inhibit maturation of CE oocytes during early hours of incubations (3&5 hr), a significant ($P<0.001$) inhibition of maturation was also recorded at this dose when the culture period was prolonged up to 20 hrs. Similarly, in case of Dd oocytes, caffeine (1.0 mM) inhibited oocyte maturation significantly ($P <0.001$) at all the time points studied (Fig. 6). Nevertheless, the potency of caffeine to inhibit spontaneous maturation was higher compared to db-cAMP or pentoxifylline used in the present study.

DISCUSSION

It is generally accepted that the mammalian oocytes undergo meiotic maturation spontaneously if released from follicles and cultured in vitro. Although LH induces maturation of mammalian oocytes, it is not required for reinitiating meiotic progression². In the present study, rat oocytes have been cultured in hormone-free medium and utilized to test the effect of db-cAMP, pentoxifylline and caffeine on spontaneous maturation of CE and Dd oocytes in vitro. The data obtained (Fig.1) clearly indicate that the removal of cumulus cells had accelerated the maturation of oocytes during early hours of incubations. However, when cumulus intact oocytes were cultured in the hormone-free medium, a significant inhibition of spontaneous maturation was observed. These results indicate to the inhibitory role of cumulus cells on spontaneous maturation of oocytes. A similar effect of cumulus cells in the maintenance of meiotic arrest has also been observed in bovine oocytes. It is suggested that the maintenance of meiotic arrest depends on the integrity of cumulus-oocytes complex by permitting the continuous transfer of inhibitory levels of cAMP to oocytes through the associated gap junctions. Therefore, the increase in the percentage of maturation of Dd oocytes in the present study may be attributed to the disruption in the flow of tonic levels of cAMP from cumulus cells to oocytes required for maintaining the meiotic arrest. Previous studies have clearly

demonstrated that a transient decrease in the level of oocyte cAMP is associated with meiotic resumption. This is supported by the fact that the mature oocytes (postovulatory) contain lower levels of cAMP compared to immature oocytes (follicular). A significant correlation between cAMP levels and maturation of oocytes has also been documented in various non-mammalian species, such as xenopus, starfish, and in catfish. The exposure of CE oocytes to various doses of db-cAMP completely inhibited their maturation during early hours of incubations (3 and 5 hrs). However, a doser-dependent inhibition of spontaneous maturation was noticed only after 20 hours of culture. These effects of db-cAMP on spontaneous maturation of oocytes *in vitro* are comparable to the findings already reported. From the present findings, it appears that the cumulative, effects of cumulus cells and db-cAMP in the inhibition of spontaneous maturation in CEOs are much stronger than those without the cumulus ceells (Dd oocytes).

One possible mechanism by which cAMP levels in the oocytes may be towered during the maturation process is through degradation by cAMP-phosphodiesterases (PDE). This hypothesis was further strengthened by observations that cAMP-PDE inhibitor (methyisobutylxanthine; MIX) directly inhibit oocytes maturation. In the present study, we have used sperm motility stimulators pentoxifylline and caffeine to explore their role on spontaneous maturation of CE and Dd oocytes *in vitro*. Pentoxifylline completely inhibited maturation of CE oocytes during initial hours of incubations. However, a dose-dependent inhibition of maturation by pentoxifylline was observed when the culture period extended for 20 hrs (Fig. 4). Pentoxifylline (1.0 mM) was also found to inhibit maturation of Dd oocytes significantly at all time points studied; though at a reduced potency (Fig.5). Similarly, various doses of caffeine completely inhibited CE oocyte maturation at all the time points except at 0.2 mM dose (Fig.6). A significant inhibition of Dd oocyte maturation by caffeine (1.0 mM) was also noticed but the inhibition level was higher compared to 1 .0 mM of pentoxifylline. Previous, studies using mammalian as well as non mammalian oocytes have also shown that cAMP-PDE inhibitors (MIX and Theophylline), which are reported to increase cAMP levels inhibited oocyte maturation *in vitro*. Based on the present study we suggest that the cumulus cells maintain the meiotic arrest probably by synthesis and transfer of inhibitory levels of cAMP from cumulus cells to oocytes and disruption in the flow of cAMP to oocytes accelerate the resumption of meiosis. On the other hand, the cAMP-PDE inhibitors, caffeine and pentoxifylline might be exerting inhibitory effects on, spontaneous maturation of CE and Dd oocytes possibly by elevating cAMP level.

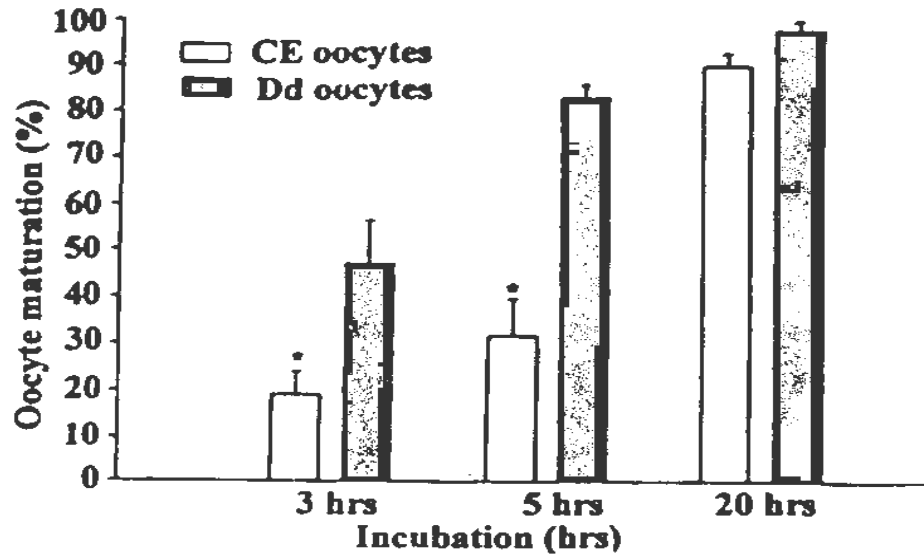


Fig.1- Role of cumulus cells on spontaneous maturation of oocytes. Oocytes were cultured within their cumulus cells (CE) or after mechanical removal of cumulus cells (Dd) for indicated periods. Each parenthesis represents mean $\pm$ SEM of 6 experiments. Data are analyzed by Student's t-test. * $P < 0.01$

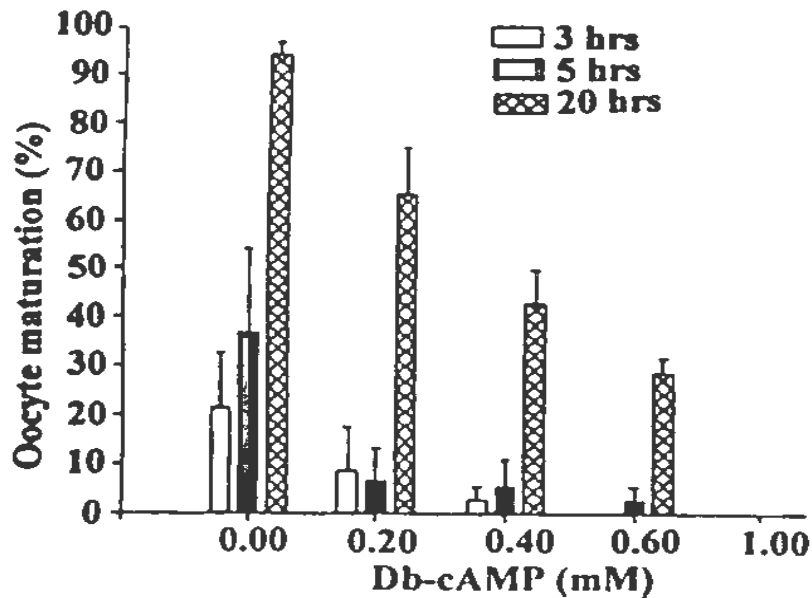


Fig.2- Dose-response of the inhibition of spontaneous maturation by db-cAMP. CE oocytes were incubated in the presence of the indicated doses of db-cAMP. At indicated times oocytes were removed and examined for maturation as described in Materials and Methods. Each value represents the mean $\pm$ SEM of 4 experiments. Data are analyzed by one way ANOVA.

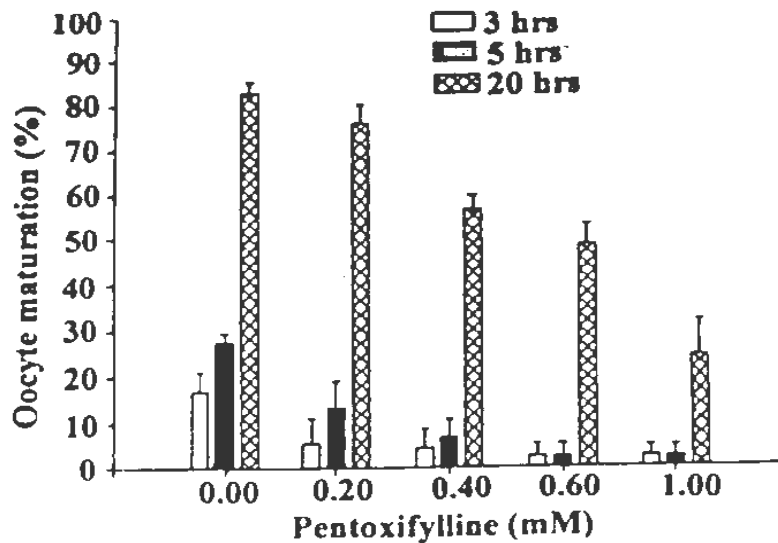


Fig.3- Dose-response of the inhibition of spontaneous maturation of CE oocytes by pentoxifylline. Oocytes were incubated with indicated doses of pentoxifylline. At indicated times oocytes were removed and examined for maturation. Data are mean $\pm$ SEM of 4 experiments and analyzed by one-way ANOVA.

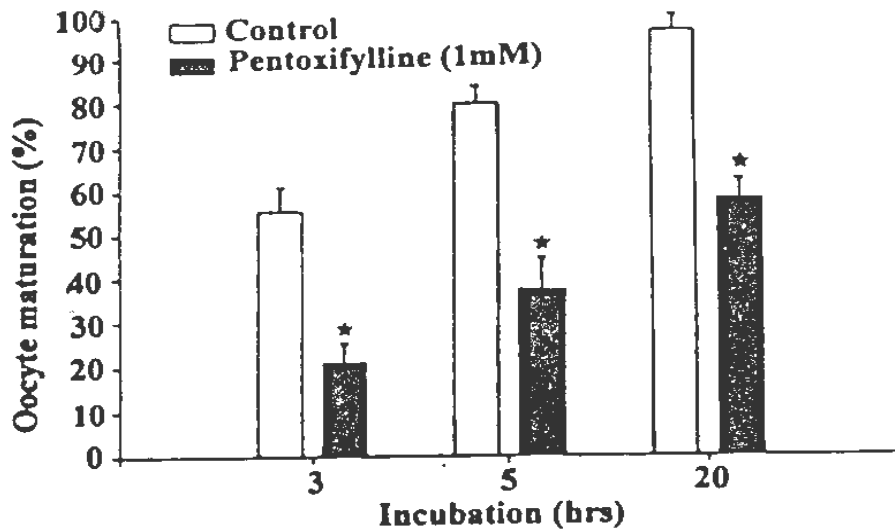


Fig.4- Time course effect of pentoxifylline on spontaneous maturation of Dd oocytes. Oocytes were cultured with indicated dose of pentoxifylline. At indicated times, oocytes were removed and examined for maturation. Each value represents mean $\pm$ SEM of 4 individual experiments. Data are analyzed by Student's t-test. * $P < 0.001$.

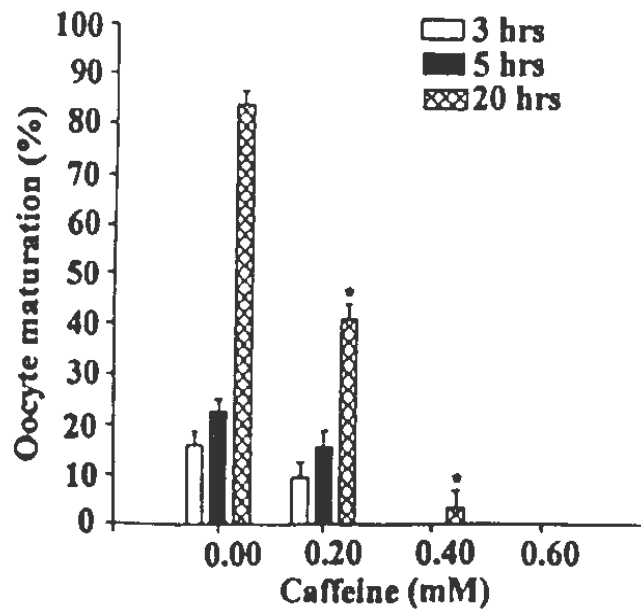


Fig. 5- Effect of various doses of caffeine on spontaneous maturation of CE oocytes. Oocytes were incubated with indicated doses of Caffeine. At indicated times oocytes were removed and examined for maturation. The mean $\pm$ SEM of 4 individual experiments are presented and data are analyzed by one-way ANOVA.

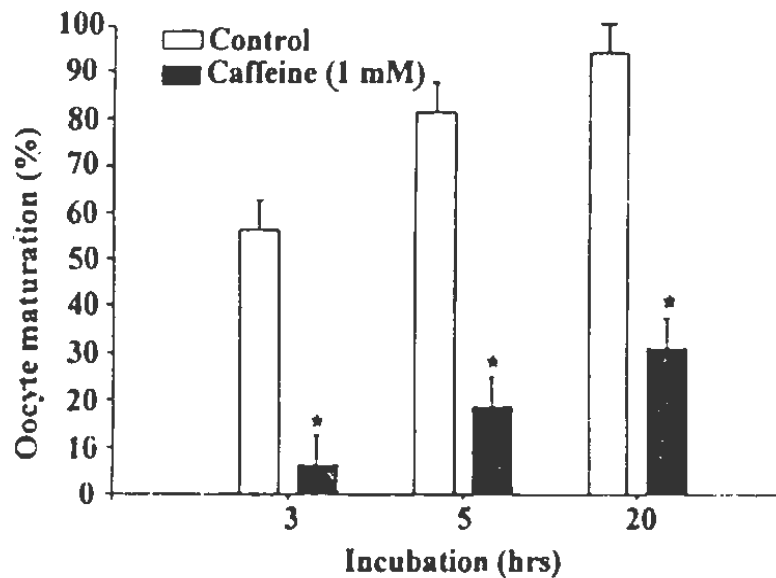


Fig. 6-Time course effect of caffeine on spontaneous maturation of Dd oocytes. Oocytes were cultured with indicated doses of caffeine. At indicated times, Oocytes were removed and analyzed for maturation. Each value represents mean $\pm$ SEM of 4 individual experiments and data are analyzed by Student's t-test. * $P < 0.001$

दो प्रकार के फॉसफेडाइटरेस संदयकों (अर्थात कैफिन और पेनीटोक्सीफिलिन) तथा सीएएमपी की कला पारगम्य सहधर्मिता के कूटक-अनुबन्ध और निरावृत डिम्बाणु-कोशिकाओं की परिपक्वता पर पड़ने वाले प्रभावों के बारे में इन विट्रो अन्वेषण किया गया था। यांगिक रूप से निरावृत डिम्बाणुजनन कोशिकाओं को हर्मोनयुक्त माध्यम से संवर्धन करने पर ऊष्मायन ($47.67 \pm 9.08\%$) के 3 घण्टे पश्चात डिम्बाणुजनन कोशिकाओं की परिपक्वता दर में महत्वपूर्ण वृद्धि दर्ज की गई थी तथा यह वृद्धि 5 घण्टे के संवर्धन के पश्चात बढ़कर $83.53 \pm 2.77\%$ हुई पाई गई थी। 20 घण्टे के संवर्धन के पश्चात डिम्बाणुजनन कोशिकाओं की परिपक्वता दर सर्वाधिक पायी गई थी। दूसरी ओर डिम्बाणुजनन कोशिकाओं के इर्द गिर्द मौजूद कूटक कोशिकाओं द्वारा उष्मायन के प्रारम्भिक काल (3 घण्टे, $9.09 \pm 4.95\%$ 5घण्टे, $32.11 \pm 8.14\%$) में परिपक्वता दर में महत्वपूर्ण कमी आई थी। किन्तु ऊष्मायन के 20 घण्टे के पश्चात कूटक कोशिकाओं का डिम्बजनन कोशिकाओं पर संदमक प्रभाव निरस्त हो गया था तथा परिपक्वता दर निरावृत डिम्बजनन कोशिका वर्ग के समान (निरावृत, $97.78 \pm 2.03\%$ अ कूटक अनुबन्ध, $90.15 \pm 2.79\%$) थी। इसी प्रकार ऊष्मायन के प्रारम्भिक काल में डीबीसीएएमपी थी विभिन्न डोजों (खुराकों) ने डिम्बाणुजनन कोशिकाओं की परिपक्वता प्रक्रिया को पूरी तरह से संयमित कर दिया गया था। पेनीटोक्सीफिलिन अथवा कैफिन द्वारा कूटक अनुबन्ध तथा निरावृत डिम्बाणुजनन कोशिकाओं को अधिक सशक्त पाया गया था। अध्ययनकाल में प्रत्येक समय-बिन्दु पर यह देखा गया था कि कूटक अनुबन्ध की परिपक्वता का कैफिन (-0.4एमएम) द्वारा पूरी तरह से संदमन कर दिया गया था। कूटक अनुबन्ध डिम्बाणुजनन कोशिकाओं की परिपक्वता संबंधी पेनीटोक्सीफिलिन द्वारा संदमन डोज पर आधारित था, जो ऊष्मायन के 20 घण्टे बाद यह देखा गया था। इसके अतिरिक्त अध्ययन के सभी समय-बिन्दुओं पर निरावृत डिम्बाणुजनन कोशिकाओं की परिपक्वता प्रक्रिया, पेनीटोक्सीफिलिन तथा कैफिन, दोनों की 1एमएम डोज से महत्वपूर्ण रूप से यह निश्कर्ष मिलता है कि कूटक कोशिकायें डिम्बाणुजनन कोशिकाओं की परिपक्वता प्रक्रिया को प्रारम्भ होने देने में विलम्ब करती हैं, सम्भवतः ऐसा संश्लेषण तथा सीएएमपी के डिम्बाणुजनन कोशिकाओं में स्थानान्तरण से होता है और सम्भवता पेनीटोक्सीफिलिन तथा कैफिन डिम्बाणुजनन कोशिका-स्तरों पर प्रत्यक्ष अनुक्रिया करते हैं जिससे इन-विट्रो परिपक्वता प्रक्रिया का संदमन होता है।

REFERENCES

1. DEKEL N, HILLENSJO T, KRAICER P. (1979): Maturation Effects of gonadotropins on the Cumulus-Oocyte Complex of the Rat, *Biol Reprod.*, 20, p-91-197.

2. WASSARMAN PM, ALBERTINI DF (1994): The Mammalian Ovum. In: Knobil E, Neill JD, (eds) *The Physiology of Reproduction*. Raven Press, New York, p- 79-122.
3. TSAFRIRI A, DECKLE N. (1994): Molecular Mechanisms in Ovulation. In: Findlay JK (ed) *Molecular Biology of Female Reproductive System*. Academic Press, San Diego, p- 207-258.
4. DEKEL N, ABERDAM E, SHERIZLY (1984): Spontaneous Maturation *in vitro* of Cumulus-Enclosed Rat Oocyte is Inhibited by Forskolin. *Biol. Reprod* 31, p- 244-250.
5. DEKEL N, GALIANI D, SHERIZLY (1988): Dissociation between the Inhibitory and the Stimulatory Action of cAMP on Maturation of Rat Oocytes. *Mol Cell Endocrinol*, 56, p-115-121.
6. DE LOOS FAM, ZEINSTRA E, and BEVERS MM (1994): Follicular Wall Maintains Meiotic Arrest in Bovine Oocytes Cultured *in vitro*. *Mol Reprod. Dev.*, 39, p-162-165.
7. Richard FJ, Sirard MA (1996): Effects of Follicular Cells on Oocyte Maturation I: Effects of Follicular Hemisection on Bovine Oocyte Maturation *in vitro*. *Biol Reprod.*, 54, r> 16-21
8. RICHARD FJ, FORTIER MA, SIRARD MA (1997): Role of the Cyclic Adenosine Monophosphate Dependent Protein Kinase in the Control of Meiotic Resumption in Bovine Oocytes Cultured with Thecal Cell Monolayers. *Biol Reprod*, 56, p-1363-1369.
9. EPPIG JJ (1993): Regulation of Mammalian Oocytes Maturation. In: Adashi EY, Leung PCK (eds). *The Ovary*. Raven Press, New York, p- 185-208.
10. SCHULTZ RM, MONTGOMERY RR, WARD-BAILY PF, EPPtG JJ (1983): Regulation of oocyte maturation in the mouse: Possible Roles of Intracellular Communication, cAMP and Testosterone. *Dev. Biol.*, 95, p- 294-304.
11. BORNSLAEGER EA, WILDE MW, SCHULTZ RM (1984): Regulation of Mouse Oocyte Maturation: Involvement of Cyclic AMP Phosphodiesterase and Calmodulin. *Dev. Biol.*, 105, p- 488-499.

12. RACOWSKY C (1984): Effect of Forskolin on the Spontaneous Maturation and Cyclic AMP Content of Rat Oocyte-Cumulus Complexes. *Jr. Reprod Fertil*, 72, p-107-116.
13. DEKEL N, BEERS WH (1980): Development of Rat Oocyte *in vitro*: Inhibition and Induction of Maturation in the Presence or Absence of Cumulus-Oophorus. *Dev Biol.*, 75, p-247-254.
14. NAGYOVA E, KAOLUS J, SUTOVSKY P AND MOTLIK J. (1993): Is cAMP Decrease Essential for Resumption of Meiosis in Mouse Oocytes? *Reprod Nutr. Dev.*, 33, p- 419-428.
15. SIKKA SC, HELLSTORM WJG (1991): Functional Evaluation and Motility Parameters of Pentoxifylline- Stimulated Cryopreserved Human Sperm. *ARTA*, 1,p- 309-319.
16. MERINO.G, CHEQUER JCM, BARAHONA E, BERMUDEZ JA, MORAN C, CARRANZA LS (1997): Effect of Pentoxifylline on Sperm Motility in NormogonadotropicAsthenozoospermic Men. *Arch Androl*, 39, p-65-69.
17. EPPIG JJ, TELFER EE (1993): Isolation and Culture of Oocytes. *Meth Enzymol* 225, p- 77-84.
18. RICHARD FJ, SIRARD MA (1996): Effects of Follicular Cells on Oocyte Maturation II: Theca Cell Inhibition of Bovine Oocyte Maturation *in vitro*. *Biol Reprod.*, 54, p-22-28.
19. ISOBE N, MAEDAT, TERADA T (1998): Involvement of meiotic resumption in the disruption of gap junctions between cumulus cells attached to pig oocytes. *J Reprod Fertility* 113, p-167-172.
20. Mailer JL, Butcher FR, Krebs EG (1979) Early Effects of Progesterone on Levels of Cyclic Adenosine 3'-5' Monophosphate in *Xenopus* Oocytes. *Jr. Biol Chem.*, 254, p- 579-582.
21. MEIJER L, DOSTMANN W, GENIESER HH, BUTT E, JASTORFF B. (1989): Starfish Oocyte Maturation: Evidence for a Cyclic AMP Dependent Inhibitory Pathway. *Dev. Biol.*, 133, p- 56-66.

22. HAIDER S, CHAUBE SK (1995): Changes in Total cAMP Levels during Oocyte Maturation in the Catfish, *Clarias Batrachus*, *Comp Biochem Physiol*, 112A, p-379-385.
23. CHO W, STERN S, BIGGERS JD (1974): Inhibitory Effect of Dibutyryl cAMP on Mouse Oocyte Maturation in vitro. *Jr. Exp Zool.*, 87, p- 383-386.
24. GOREN S, DEKEL N (1994): Maintenance of Meiotic Arrest by a Phosphorylated *p* is Independent of Cyclic Adenosine 3'-5' Monophosphate, *Biol Reprod.*, 51, p- 956-962.
25. HAIDER S, CHAUBE SK (1996): In Vitro Effects of Forskolin, IBMX and Cyanoketone on Meiotic Maturation in Follicle-Enclosed Catfish (*Clarias batrachus*) Oocytes, *Comp Biochem Physiol*, 115C, p-117-123.
26. ROSE-HELLEKANT TA, BAVISTER BD (1996): Roles of Protein Kinase A and C in Spontaneous Maturation and Forskoline or 3-isobutyl-1-Methylxanthine Maintained Meiotic Arrest of Bovine Oocytes. *Mol Reprod Dev.*, 44, p-241-249.

**INTER-STATE VARIATION IN AVAILABILITY AND USE
OF ELECTRONIC MEDIA FOR FAMILY WELFARE
PROGRAMME IN INDIA**

P.L. Trakroo*

ABSTRACT

This paper examines the socio-demographic profile of women in the reproductive age in India and assesses the possession of electronic media in their households and their use. It also analyses the extent to which family planning messages have been heard or seen on electronic media. The paper proves that education of women effects the use of electronic media by them to a great extent to know more about family welfare. Kerala with the highest literacy rate had a fertility rate of less than two, while other States with lower literacy rates had fertility rates which were 4 and above, It was amazing to know that in larger States 60 to 70 per cent of women had never been exposed to any media.

The family planning programme has from the beginning remained a centrally sponsored programme and so are the IEC policy and funding guidelines to the States. The broad outline of implementation and monitoring strategies of this programme are normally provided by the Central Government. Very few State Governments have introduced changes in their programme operations including IEC. The experiment with newer strategies has remained limited in scope and nature. In such situations, IEC strategies do not necessarily identify and recognise the intricate web of cultural diversities and socio-cultural dimensions. Communication activities are essentially required to generate sustainable processes at the individual, family and community levels. Communication efforts have to be continuous, consistent and holistic in nature so that a process is generated which is sustainable and effective in reaching the people and influencing their behaviour.

*Professor and Head, Department of Communication, National Institute of Health and Family Welfare, Munirka, New Delhi-110 067.

This paper assesses the inter-State variations in terms of (a) availability and use of electronic media by women in the reproductive age in India; (b) the inter-spouse communication as reported by women for determining either contraceptive use or the family size; and (c) the knowledge of women in reproductive age about legal age at marriage for boys and girls.

Data utilised for this paper have been derived from National Family Health Survey (1992- 93) which was conducted to provide national and State level data on fertility, nuptiality, family size, preferences, knowledge and practice of family planning, the potential demand for contraception, the level of unwanted fertility and host of other issues regarding mother and child health. The content and design of questionnaires were based only on DS Model-B which are designed primarily for use in countries with low contraceptive prevalence rates. The sample size of each State was specified in terms of target number of interviews with eligible couples. From all the States 89,777 women in the reproductive age group were interviewed, of whom 27,534 were from urban areas and 62,243 were from rural areas.

Demographic and Social Scenario of Women in Reproductive Age in India (Table 1 (A and B))

In India, women have remained late entrants in the use of developmental initiatives which were started after independence. Their quality of life has remained fairly low for a long period of time in spite of the determined efforts made by the government, non- government, international and bilateral agencies. The intensive programmes for improving the educational status of girls, the provision of women representation in local self-governmental institution (Panchayati Raj) through 73rd amendment in the Indian Constitution, the reproductive health services specifically for the mother and child care; and income generating programmes for women are some important initiatives which helped empowering women in India. The profile of Indian women has been examined on limited variables in the NFHS survey such as (a) literacy; (b) infant mortality rates; (c) life expectancy of women at birth; (d) couple protection rates; (e) total fertility rates and (f) sex ratio.

Achievement in literacy rate of women is an important determinant of their empowerment. In India, although overall educational achievements are fairly poor when compared to other developing countries, women in particular have received some attention towards education, except in smaller States like Goa, Kerala and Delhi. In other States, more than 42 per cent of women continue to be illiterate. The situation is depressing in some of the larger States such as Uttar Pradesh, Rajasthan, Madhya Pradesh and Bihar, where only less than one-fourth of all

women in the reproductive age are literate. Following the same trend, the total fertility rate (TFR) of women is fairly high (4 and above) in these States (including Haryana) where literacy rates among women in the reproductive age is low. The other States having TFR between 3 and 3.9 are Punjab, Gujarat, Maharashtra, Andhra Pradesh, Assam and Karnataka. Only Kerala had a total fertility rate of less than 2. This shows a positive co-relation between achievements in educational levels and total fertility rates in various States in India.

The couple protection rate (CPR) is an indirect method to assess the effectiveness of the family planning programme. The larger States of Uttar Pradesh, Rajasthan, Bihar, Assam, Madhya Pradesh, Andhra Pradesh and West Bengal had lower CPR ranging between 20 and 39 per cent. In these States the crude birth rate was equally higher also. Only in case of Punjab, couple protection rate was 73 per cent and birth rate was 27.1. In smaller States like Kerala, Goa and even in Tamil Nadu, the birth rates had already shown a decline. It was in these States that couple protection rates are markedly higher than 67 per cent except in Tamil Nadu where it was only 51.3 per cent.

Infant mortality rate (IMR) is yet another important sensitive index of the quality of life among women. In India, large variation exists among different States. In smaller States such as Kerala and Goa, IMR was 17 and 20 per 1000 live births. In larger States of Madhya Pradesh and Uttar Pradesh, the IMR was 104 and 98 respectively which was much higher than the national average of 72. In other larger States such as Rajasthan, Bihar, Karnataka and Assam, IMR was much higher than the national average. In Haryana, the IMR was 75. In this case also, it is observed that larger States like Rajasthan, Bihar, Uttar Pradesh, Madhya Pradesh, Karnataka and Assam had higher IMR, lower CPR and higher birth rates. These are the indications of low quality of life being lived by women in these States.

Another important indicator of quality of life is the life expectancy of women at birth. Life expectancy of women was found to be the highest among Kerala women (72.3 years) and the lowest among the women from Uttar Pradesh (49.6 years). In the States of Madhya Pradesh, Bihar, Rajasthan and Assam, the expectancy of life among women ranged between 53.6 and 56.2 years. However, in other States life expectancy was higher than 60 years.

The sex ratio was found to be fairly low in the States of Haryana (865 per thousand males), Uttar Pradesh (879) and Andhra Pradesh (872). In the States of Kerala (1036), Himachal Pradesh (976) and Tamil Nadu (974), the rates are above the national average.

Electronic Media Availability and their Use by Women in Reproductive Age in India

The socio-economic development scenario in Indian States has remained intimately related to the extent of exposure to media. From the overall human development index point of view, the larger States of Uttar Pradesh, Madhya Pradesh, Bihar and Rajasthan (popularly known as Hindi belt) have remained fairly low on this index, meaning thereby that their overall media exposure was also low.

Radio and television are powerful media and their reach has almost covered between 90 and 98 per cent of the geographic area of the country. In larger States of Uttar Pradesh, Bihar, Madhya Pradesh, Rajasthan and Assam, the possession of radio in households was fairly low with only one-third of them possessing radio sets. In population-wise, smaller States like Kerala, Goa, and Jammu and Kashmir, more than 60 per cent of households were possessing radio sets in their households. In other States, the range of households possessing radio sets was between 41 and 51 per cent. In economically developed States such as Punjab, Haryana, Himachal Pradesh and Karnataka, around half of the households possessed radio sets. In India, radio is available in around 59.4 per cent of the households. Further, bigger States have lesser number of households and smaller States have higher number of households are in possession of radio sets. It had also been established that around 40 per cent of households in India do not possess radio which directly influence their level of awareness of various developmental initiatives undertaken by the government.

When women were assessed about their listening habits to radio, it was found that in the States of Goa, Delhi, Kerala, Andhra Pradesh, Jammu, Karnataka and Tamil Nadu, the range of women who listen to radio programmes was between 60 and 70 per cent. In bigger States of Uttar Pradesh, Madhya Pradesh, Bihar, Rajasthan and Assam, the range of women listen to radio was between 26 and 33 per cent, almost half of what had been the case in smaller States. In other States, around 47 per cent of women listened to radio. In almost all States, number of women who listened to radio was always more than the number of women who possessed the radio sets. However, in Haryana, Bihar, Madhya Pradesh, Rajasthan and Punjab, listening to radio was comparatively less than its possession. Further, in larger States, the radio listeners had been lower in comparison to smaller States where the percentage of such women had been above 60 per cent.

The situation in relation to ownership of television among households in India was fairly dismal. In States of Bihar, Uttar Pradesh, Rajasthan, Madhya Pradesh, Assam, West Bengal and Kerala, the possession of television in households was between 10.6 and 19 per cent. In economically progressive States like Punjab (51.9%), Haryana (40.3%), and Jammu (37.9%), the percentage of owning television sets varied between 38 and 52 per cent. Comparatively, availability of television sets was found to be lesser among socio-economically weaker and larger States of the country. Even in health-wise progressive State like Kerala, only 19.2 per cent of households owned television sets. However, the possession of radio, a cheaper option among electronic media in this State was around 60 per cent and radio listening audience among reproductive women was much higher i.e. 73.3 per cent.

The viewership of television was high in all the States of the country. The lowest viewership of television among women in the reproductive age group was from Bihar (12.7%) and the highest was from Delhi (82.8%). In States such as Rajasthan (17.9%), Bihar (12.7%) and Assam (18.0%), less than 20 per cent of women were viewing television at least once in a week. In these States, the availability of television sets was equally poor. However, comparatively television was gaining viewership at a faster rate than radio.

Before the advent of television, watching cinema was an important medium of entertainment and dissemination of information. Each cinema house in India was expected to screen a documentary film in order to increase awareness of government programmes among the viewers. However, after the advent of V.C.P. and V.C.R., the cinema is gradually losing its attraction and attention. A sharp variation in visiting cinema was observed among various States of the country. In States like Goa, Delhi, Assam, Rajasthan, Himachal Pradesh, Jammu, Gujarat, Punjab and Haryana, only 2 to 9 per cent of women in the reproductive age were watching cinema at least once a month. However, in States of Tamil Nadu (42.6%), Karnataka (30.3%) and Andhra Pradesh (48.8%), a higher percentage of women watching cinema at least once a month. The data show that women in the reproductive age from South Indian States visited cinema more frequently than the North and central Indian States. Interestingly, the ownership of television in high cinema going States of Tamil Nadu, Karnataka and Andhra Pradesh was fairly low.

Irrespective of the fact whether women in their household owned electronic media or not, the alarming situation was that in larger States women between 60 and 70 per cent had never been exposed to any media. The reach of TV or radio may seemingly be high but its effective reach in Uttar Pradesh, Assam, Rajasthan,

Madhya Pradesh and Bihar was fairly dismal that shows one-fourth of them was ever exposed to these media. In other States such as West Bengal, Punjab, Himachal Pradesh, Gujarat, Maharashtra and Haryana, more than one-third of women in the reproductive age group was not exposed to any media.

Age at Marriage

The age at which women in India seek marital alliances has bearing on their fertility span. A general assumption is that women having accurate knowledge about legal age at marriage of boys and girls would normally ensure that their children would not marry earlier than the prescribed age. Two important observations emerged from the data. The first being that higher proportion of women from all States knew accurately the correct age at marriage for girls than of boys. In case of Assam, only 4 per cent of the women knew the legal age at marriage of males. Even in West Bengal (10.7%), Tamil Nadu (19.6%), Bihar (12.8%), U.P. (17.7%), M.P. (15.9%) and Rajasthan (18%), a very low percentage of women could accurately specify the age at marriage of males. Even in progressive States like Kerala and Goa, just over one-fourth of women could correctly state the age at marriage of males.

In States like Kerala (65.3%), Delhi (65.4%), Himachal Pradesh (56.3%) and Maharashtra (49.1%), women accurately knew the legal age at marriage of women. The least number of women who could correctly state legal age at marriage of girls was from Assam and Bihar (18.9%) followed closely by U.P. (26.9%) and M.P. (24.6%). In case of Goa, Tamil Nadu, West Bengal, Gujarat and Jammu, only one-third of women correctly stated the legal age at marriage among women. However, for Haryana and Punjab, more than 40 per cent of women were able to state the legal age at marriage of girls correctly.

Inter-Spouse Communication

It is observed that inter-spouse communication facilitates the acceptance of fertility regulating methods and even decisions about family size. In order to assess the extent of inter-spouse communication among women in the reproductive age group, they were specifically asked to state the frequency of such communication for promoting family welfare. It was found that a high proportion of women in the reproductive age from the States of U.P. (51.9%), M.P. (63.2%), Bihar (60.1%), Andhra Pradesh (57.8) and even Tamil Nadu (51.9%) had never discussed family planning issues with their husbands. Even in progressive States like Goa (41.3%), Himachal Pradesh (42.0%), Gujarat, West Bengal and

Maharashtra (40 to 42%), more than 40 per cent of women had never discussed about this issue with their husbands. On this issue, urban women were found to be better than rural women.

TABLE 1 (A)
ELECTRONIC MEDIA OWNERSHIP AND EXPOSURE TO FAMILY WELFARE
AMONG WOMEN IN INDIA

(PRIVATE)	Knowledge about legal age at marriage known correctly		Knowledge of contraceptives		Non-Acceptability of messages of F.W.	Acceptability of mess of F.W.
	Boys	Girls	Any method	Source known		
Madhya Pradesh	15.9	24.6	80.7	80.5	12.6	50.0
Uttar Pradesh	17.7	26.9	95.7	77.8	10.6	50.3
Rajasthan	18.0	26.9	76.4	76.3	7.8	55.1
Bihar	12.8	18.9	88.1	88.0	11.6	37.5
Andhra Pradesh	27.5	38.0	94.5	94.5	3.1	86.7
Haryana	27.0	40.9	98.3	98.2	6.7	82.2
Assam	3.8	18.8	92.1	89.7	4.7	85.3
Gujarat	23.6	33.7	94.4	94.0	4.5	81.4
Jammu & Kashmir	21.7	33.9	97.6	97.5	5.5	79.9
West Bengal	10.7	31.6	95.2	92.8	5.8	83.5
Maharashtra	31.4	49.1	95.6	95.6	13.1	77.4
Karnataka	23.7	40.9	96.7	96.1	4.8	77.8
Himachal Pradesh	28.9	56.3	97.6	97.5	6.5	84.1
Tamil Nadu	19.6	38.9	97.7	97.6	3.3	92.5
Punjab	33.0	41.1	99.5	99.4	3.3	81.8
Kerala	27.6	65.3	98.8	98.7	6.8	87.4
Delhi	50.5	65.4	94.5	93.9	-	-
Goa	24.7	35.9	95.7	95.3	4.7	63.4

*Data for Kashmir division were not available

U - Not available

TABLE 1 (B)

**ELECTRONIC MEDIA OWNERSHIP AND EXPOSURE TO FAMILY WELFARE
AMONG WOMEN IN INDIA**

(PRIVATE)	Owning Radio	Listenin to Radio	Owning T.V.	Watchin T.V.	Watchin Cinema	No inter- spouse communi cation	No Regularly Exposed To an/ Media
Madhya Pradesh	33.1	32.7	19.1	26.7	10.0	63.2	59.0
Uttar Pradesh	32.6	29.0	16.8	19.0	4.1	51.9	64.5
Rajasthan	32.7	27.2	16.6	17.9	5.2	55.5	69.9
Bihar	26.9	25.9	10.6	12.7	5.2	60.1	70.5
Andhra Pradesh	42.9	62.4	17.8	39.1	48.8	57.8	24.8
Haryana	50.0	42.2	40.3	49.0	2.0	32.7	39.9
Assam	29.9	32.8	17.8	18.0	4.2	21.3	60.9
Gujarat	41.0	47.0	24.4	39.4	9.5	-41.5	44.6
Jammu & Kashmir*	62.7	64.2	37.9	50.1	2.5	37.9	27.8
West Bengal	43.7	46.3	19.1	33.3	16.1	41.3	38.7
Maharashtra	43.0	52.3	30.4	46.4	14.9	40.2	37.2
Karnataka	51.7	62.9	21.9	39.5	30.3	42.4	29.9
Himachal	50.0	54.6	32.2	47.1	2.9	42.0	33.2
Tamil Nadu	43.9	59.7	20.0	50.4	42.6	51.9	22.0
Punjab	50.8	42.0	51.9	57.3	2.3	30.5	34.5
Kerala	59.9	71.3	19.2	42.2	18.3	38.6	20.8
Delhi	U	63.6	U	82.8	5.7	U	13.3
Goa	65.0	69.3	49.1	70.6	3.9	41.3	14.8

*Data for Kashmir division were not available

U- Not available

Lkkjk'k

इस लेख में प्रजनन आयु वर्ग की भारतीय महिलाओं की सामाजिक-जनांकिकीय स्थिति की समीक्षा करने के साथ-साथ उनके घरों में उपलब्ध इलेक्ट्रॉनिक मीडिया उपकरणों और उनके प्रयोग संबंधी आंकलन प्रस्तुत किया गया है। प्रस्तुत लेख में यह विश्लेषण भी किया गया है कि इलेक्ट्रॉनिक मीडिया उपकरणों पर परिवार नियोजन संबंधी संदेश किस सीमा तक सुने और देखे जाते हैं। लेख में यह भी सिद्ध किया गया है कि महिलाओं का शिक्षा स्तर इलेक्ट्रॉनिक मीडिया उपकरणों के प्रयोग को काफी हद तक प्रभावित करता है। केरल में साक्षरता दर उच्चतम होने के कारण प्रजनन दर दो से कम है जबकि अल्प साक्षरता दर वाले अन्य राज्यों में प्रजनन दर चार तथा इससे अधिक है। यह बात चौंका देने वाली है कि बड़े राज्यों में 60 से 70 प्रतिशत महिलाओं ने कभी किसी मीडिया उपकरण का उपयोग नहीं किया था।

KNOWLEDGE OF SLUM ADOLESCENTS ABOUT COMMON CHANGES OF SECONDARY SEXUAL CHARACTERS

Dalvir Singh*

ABSTRACT

The study clearly shows that the slum adolescents profoundly lack appropriate and adequate knowledge of sexuality related matters. More than 50 per cent of adolescents were aware of moustache and beard as common signs of secondary sexual characters for boys. Knowledge of males regarding nightfall and pubic hair (male) is 16.8 per cent and 12.9 per cent respectively. Approximately 25 per cent of males were aware of menstruation and breast development as pubertal changes in female and only 12 per cent knew pubic hair (female) as a secondary sexual character among females. On the contrary, less than 10 per cent of female adolescents were aware of nightfall and pubic hair (male) as pubertal changes among males. Regarding female pubertal changes, more than 60 per cent of females knew menstruation as a sign of puberty but their awareness about breast development decreased to 40 per cent and pubic hair (female) further decreased to merely 13 per cent as signs of puberty.

"Condom is a pill used by both male and female to prevent pregnancy," this was how a few college students in Mumbai perceived the condom, says a Rockefeller-funded study on adolescents, sexuality and fertility in India. The study findings suggest skewed knowledge on sexuality among adolescents in the age group of 15-22, the target group of the study.

Apparently, adolescents both boys and girls have a very little knowledge about reproductive anatomy, physiology, sex and contraception. Girls have almost no information and boys are misinformed. The research coordinated by the Washington-based International Center for Research on Women (ICRW)

*Consultant (Medical) RCH, National Institute of Health and Family Welfare, Munirka, New Delhi-110067.

pointed out that the lack of knowledge about sexuality had serious implications in reproductive health because lack of information could result in unintended pregnancies, sexually transmitted diseases including AIDS, etc.

A part of the study conducted by the Tata Institute of Social Sciences (TISS) in Mumbai, focussing on college going youths in the low income bracket found that the main sources of information regarding sex were pornographic films, magazines and friends. A parallel sub study by the Pune-based KEM Hospital and Research Centre similarly found that the knowledge about reproductive health was generally incomplete. The study found that existing reproductive health services did not serve adolescents and despite suffering from infections of the reproductive tracts, the target group did not utilize health centres. Vellore-based Christian Medical College found that adolescents did not use contraceptives for spacing. More seriously, induced abortions were used as spacing method and adolescents mainly visited quacks for abortions. At the main hospital in Solapur, a sleepy little town of Maharashtra, 30 per cent of the abortion seekers were under 15 years of age. A recent report of UNFPA (United Nations Fund for Population Activities) on adolescents in India suggests a high level of premarital sexual activity among the adolescents and specially the males. In most cases these males sought out sex workers for their first sexual experience. It is worrying because most of this is unprotected sex leaving the adolescents vulnerable to AIDS/HIV virus. This study also reveals that awareness of HIV/AIDS is low across all ages and education levels. The majority of information on sexual and reproductive issues is obtained from peers which could be misleading and inaccurate. According to a UN agency, the incidence of AIDS is shifting towards the youngs and women. It says 50 per cent of all new infections are being reported from the age group of 10 to 25.

According to a survey conducted by the Central Social Welfare Board covering six metropolitan cities of India, it was found that the number of women and children, who fell victims of commercial sexual exploitation, was between 70,000 and 1,00,000. It also revealed that about 30 per cent of them were below 18 years of age.

MATERIALS AND METHOD

This paper is a part of the thesis "Assessment of Communication Needs about Sexuality, RTI, STD and AIDS among Slum Adolescents" undertaken at Nand Nagari, Delhi. The level of knowledge regarding common pubertal

changes among the slum adolescents is analysed in this article. It is based purely on survey research design and descriptive in nature.

Out of the total sample size of 200 adolescents chosen randomly ranging from 15-20 years of age, 54.5 per cent belonged to 15-17 years and 45.5 per cent to 18-20 years. 53.5 per cent constituted males and 46.5 per cent were females. 6.5 per cent of adolescents were married and 93.5 per cent were unmarried population (dominant). Education wise, 11.5 per cent were graduates, 16.5 per cent were intermediates, 20.0 per cent were high school pass, dominated by 45 per cent middle pass and only 7.0 per cent of adolescents were primary pass.

Data Collection

Interview schedule was prepared both in Hindi and English to collect relevant data. The interview schedule consisted of sexuality related matters, out of which secondary sexual characters were chosen for assessment of knowledge. The secondary sexual characters were grouped into mainly two subheads, male and female, in the interview schedule.

Moustache and beard; Night fall/genital development; and Pubic hair were considered for males. Menstruation; Breast Development; and Pubic hair were considered for girl's secondary sexual characters.

Interview method and focus group discussion were used to collect data from the respondents. All the responses were coded as per coding plan.

Assumption

The slum adolescents are thought to be lacking basic knowledge of various aspects of sexuality; as their parents are uneducated, socio-culturally backward, poor and orthodox. The adolescents totally neglected their reproductive health and ashamed of telling their sexuality related problems to their parents. They generally discuss such problems with peers who are misinformed. RTIs are very common among the adolescents but refrain from availing of the available health services. They are often seemed to be consulting the quacks or dais readily available in such areas which is dangerous and detrimental to their health. STDs are also common due to premarital or extra marital relations and could develop HIV/AIDS. The unintended pregnancies are

terminated by the quacks or untrained dais which result in high mortality and morbidity among adolescents.

FINDINGS AND DISCUSSION

It is clear from Table 1 that only 58 per cent of adolescents were aware that moustache and beard are the initial visible indications of puberty in males-and remaining 42 per cent were not knowledgeable. Merely 12 per cent of slum adolescents knew that Nightfall and genital development are the initial features of pubertal changes among males and 88 per cent had no knowledge of these changes that taken place in their body. Regarding Pubic hair development among the males, only 12.5 per cent of adolescents could answer correctly whereas the remaining 87.5 per cent (Majority) could not answer. The findings suggest that these slum adolescents need an intensive education regarding 'how and what physical changes' take place when an individual pass through adolescent period.

TABLE 1
SECONDARY SEXUAL CHARACTERS (MALE)

(i) Moustache & Beard

Response	Male (%)	Female (%)	Graduate (%)	Intermediate (%)	High School (%)	Middle (%)	Primary (%)	Total
Correct	55.10	61.30	56.50	42.40	70.00	60.00	50.00	58.00
Incorrect	44.90	39.70	43.50	57.60	30.00	40.00	50.00	42.00

(ii) Nightfall/ Genital Development

Correct	16.60	6.50	34.80	15.20	12.50	5.60	7.10	12.00
Incorrect	83.20	93.50	65.20	84.80	87.50	94.40	92.90	88.00

iii) Pubic Hair (Male)

Correct	12.90	10.90	26.10	21.20	12.50	7.80	0.00	12.00
Incorrect	87.10	89.10	73.90	78.80	87.5	92.20	100.00	88.00

In response to menstruation as a feature of secondary sexual character in females, only 43.3 per cent of adolescents could reveal correct answer, of which, majority of females responded correctly than males. 56.7 per cent could

not respond correctly (Table 2). Only 31.5 per cent of slum adolescents know about the Breast development as a feature of pubertal changes among females whereas remaining 68.5 per cent had no knowledge about this. Merely 16.5 per cent of adolescents were knowledgeable regarding Pubic hair (female) as one of the features of Puberty among females and rest 83.5 per cent (majority) did not know about it. (Table 2). Here girls had better knowledge of physical changes that take place in their body during adolescent period as compared to boys.

TABLE 2
SECONDARY SEXUAL CHARACTERS (FEMALE)

i) Menstruation

Response	Male (%)	Female (%)	Graduate	Interme- diate (%)	High School (%)	Middle (%)	Primary (%)	Total (%)
Correct	26.20	63.40	78.20	54.50	50.00	32.20	14.30	43.30
Incorrect	73.80	36.60	21.70	45.50	50.00	67.80	85.70	56.70

ii) Breast Development

Correct	24.20	38.80	56.50	42.20	32.50	23.30	14.30	31.50
Incorrect	75.80	61.20	43.50	57.80	67.50	76.70	85.70	68.50

iii) Pubic Hair (Female)

Correct	12.10	12.90	26.10	18.20	22.50	13.30	0.00	16.50
Incorrect	87.90	87.10	73.90	81.80	77.50	86.70	100.00	83.50

The above findings clearly show that the slum adolescents under study profoundly lack the knowledge of sexuality component, i.e., pubertal changes. These are inevitable and basic physical and physiological changes each one of them might have come across. Moustache and beard are very common pubertal changes, mentioned by just half of the adolescents. Very few adolescents, i.e., 12-16 per cent knew specific criteria like nightfall, pubic hair (male and female) only. Females were seen quite ignorant of pubertal changes. Higher educated adolescents had better knowledge of pubertal changes than the lower educated adolescents.

When all the six criteria taken together (Table 3) it was observed that 3.7 per cent of males and no female could tell all the 6 criteria correctly as indications of development of secondary sexual characters. 3.7 per cent of males and 3.2 per cent of females could answer the five criteria correctly (except pubic

hair (female). 5.6 per cent of males and 15.1 per cent of females replied correctly 4 of the six criteria (except breast development and pubic hair (female). 8.4 per cent of males and 21.5 per cent of females responded correctly first 3 of the six criteria. 15.0 per cent of males and 23.7 per cent of females could answer the first 2 of the 6 criteria correctly. 28.0 per cent of males and 16.1 per cent of females gave correct answer to first 1 of the 6 criteria and 35.5 per cent of males and 20.4 per cent of females did not reply any of the six criteria.

TABLE 3
SECONDARY SEXUAL CHARACTERS MALE AND FEMALE TAKEN
TOGETHER

	No Response to any (0-0)	One Correct Answer (1-0)	Two Correct Answer (2-0)	Three correct Answers (3-0)	Four Correct Answers (4-0)	Five Correct Answers (5-0)	Six Correct Answers (6-0)
Male	35-50 (%)	28.00%	15.00%	8.40%	5.60%	3.70%	3.70%
Female	20.40%	16.10%	23.70%	21.50%	15.10%	3.20%	0.00%

CONCLUSION

The study concludes that the slum adolescents profoundly lack appropriate and adequate knowledge of sexuality or sexuality related matters. Regarding pubertal changes, girls had better knowledge as compared to boys. Education had influence on the knowledge of the adolescents regarding the development of secondary sexual characters. None, but only sex education incorporated in the school/college curriculum can fill up the gaps by updating their knowledge. IEC activities through NGOs can be accelerated to enhance their knowledge. This study can be utilized as a model in public interest for decision making at appropriate levels.

प्रस्तुत अध्ययन से यह स्पष्ट होता है कि मलिन बस्ती में रहने वाले किशोरों में यौन संबंधी मामलों के बारे में उचित तथा पर्याप्त ज्ञान का अत्यन्त अभाव है। 50 प्रतिशत से अधिक किशोरों को यह जानकारी थी कि किशोरावस्था में लड़कों में दाढ़ी-मूछें आना स्वाभाविक परिवर्तन प्रक्रिया है। स्वपनदोष तथा जघन-रोमावली (पुरुषों में) के बारे में क्रमशः 16.8 प्रतिशत तथा 12.9 प्रतिशत किशोरों को जानकारी पाई गई थी। लगभग 25 प्रतिशत किशोरों को यह जानकारी थी कि किशोरावस्था में महिलाओं में रक्तस्राव होना तथा स्तनों की विकास प्रक्रिया प्रारम्भ हो जाती है। केवल 12 प्रतिशत को ही यह जानकारी थी कि यौन लक्षणों में परिवर्तन के कारण महिलाओं में जघन-रोमावली का विकास होता है। इसके विपरीत 10 प्रतिशत से भी कम लड़कियों में ही यह होते हैं। महिलाओं में यौवनावस्था संबंधी परिवर्तनों का जहां तक संबंध है 60 प्रतिशत से अधिक किशोरियों को यह जानकारी थी कि रक्तस्राव होना यौवन प्रारम्भ होने का लक्षण है, स्तनों के विकास के बारे में केवल 40 प्रतिशत को तथा जघन-रोमावली के बारे में केवल 13 प्रतिशत को ही जानकारी थी कि यह परिवर्तन यौवन प्रारम्भ होने का लक्षण है।

REFERENCES

1. DAKSHINAMURTHY, K.S. (2000): Skewed Knowledge on Sexuality-Study Finds Adolescents Ignorant about Reproductive Anatomy, May, 8, The Hindustan Times.
2. MAHAPATRA, SATYEN (2000): Clear and Present Danger: Carefree Teens, Careless Sex-Experts Attribute it to Easier Access to Information. The Hindustan Times, October 7, 2000.
3. CHADHA, KUMKUM (2000): Report Lists Avenues of Sexual Exploitation. The Hindustan Times, June, 20.