



ICMR BULLETIN

DIRECTOR-GENERAL
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RESEARCH INFORMATION BULLETIN
DIVISION OF PUBLICATION & INFORMATION
ANSARI NAGAR NEW DELHI-110016.
COMMUNITY HEALTH CELL

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Vol. 7 No. 2

326, V Main, I Block
Koramangala
Bangalore-560034
India

February, 1977

DRUG ADDICTION - AN OVERVIEW

The phenomenon of drug abuse is not recent. Man has always used different substances to alter mood states. The reasons for usage of drugs vary and are highly individual. It is sufficient to note that every society has recognised the need of its members to escape reality or produce euphoria and provided for a culturally acceptable drug use/abuse. However, consumption of a drug alone, does not imply dependence. The use of culturally sanctioned drugs in a controlled manner even if dependence producing is not considered "abuse".

The problem of drug abuse has received greater attention in recent times, not so much due to the novelty or magnitude of the problem itself, but more due to the changing trends in usage. The age old culturally circumscribed barriers in drug usage are being thrown aside.

Asian countries, from Turkey to Thailand, are the areas traditionally growing opium. India, is one of the World's largest exporters of raw opium for medical purposes. The growth, cultivation and export of opium has been a subject of international cooperation for a long time, and all the previous agreements have now been consolidated into the Single Geneva Convention¹, which now regulates international control measures, from growth to sale, for all narcotics. Also included among narcotics in the Single Geneva Convention, is cannabis which is not in fact, a narcotic but a hallucinogen.

Since cannabis and opium are grown in the Asian countries, there is considerable social familiarity, regulation and controlled usage

of these substances, by the general population. In an effort to implement the International agreement, most of the Asian countries moved to ban the growth and cultivation of opium.

In the sixties, alongwith other social changes in the environment, Western countries experienced an increase of drug abuse, particularly in the younger generation. The substances abused were cannabis, LSD (which at one time was used therapeutically) and other hallucinogens as well as heroin. Since heroin was manufactured from opium, the pressure on Asian countries to ban cultivation was increased and in most of these countries ban on opium cultivation followed. Simultaneously, stricter police regulatory measures were enforced, to check illicit traffic.

Legislation in the concerned countries ignored the problem of the socially integrated drug abuser, who suddenly found himself classified as an addict. However, in the absence of an effective administrative control, and poor health services, these measures failed to control a basically socially integrated behaviour. Instead, a fertile ground was created for illicit traffic in narcotics and for introduction of more potent drugs like heroin and morphine. Surveys from most of these countries show a high prevalence of heroin abuse in the population, especially so in students.

In India, the problem of drug addiction, took quite a different shape, and presented different dimensions. The Government of India had a well defined policy controlling the

growth and cultivation of opium even prior to the 1961 agreement, almost dating back to 1895. Further, when in 1954, India controlled opium consumption, unlike other Asian countries, it took to opium rationing rather than total ban and hence provided for the addicts and the social users in the general population. The period in which India undertook this programme was also relatively calm and heroin abuse on a vast scale had not yet started, even in the West. Also, wisely enough, India did not simultaneously ban or control cannabis, but allowed its abuse and also relaxed the laws on alcohol consumption.

During these years, certain other factors mainly geo-political in nature, helped India escape the heroin epidemic which swept the rest of South East Asia. Geographically, Indian borders were relatively closed to traffic from other Asian countries e.g. Afghanistan, where large illicit cultivation took place. Politically, there was no large scale presence of any foreign troops. However, in recent times, the situation has altered to some extent. The border with other Asian countries being open, and enforcement measures in some tightening up, it is to be expected that opium as well as heroin will begin to appear in India from overland routes with increasing frequency, initially for transshipment to other countries, and later on for consumption within the country.

Magnitude of the problem in India:

Indian studies in the area of drug abuse are few, though one of the earliest and most exhaustive studies on drug dependence was conducted on Cannabis by the Indian Hemp Commission². The available Indian studies can be classified into four broad categories viz. (i) studies which primarily deal with epidemiology of mental illnesses, (ii) those which deal specifically with drug addiction in the general population, (iii) drug addiction in the student population and (iv) clinical studies which deal with adverse effects of drug abuse.

Epidemiology of Mental Illnesses:

In a community survey of psychiatric morbidity³, drug dependence was found in 2.27 per cent of the population in Delhi-Agra regions. Further analysis of these cases of drug dependence by drugs abused, showed alcohol dependence in 59.4 per cent followed by *bhang* in 17.5 per cent and poly drug addiction in the rest. Among socio-demographic correlates,

drug abuse was highest in semi-rural areas, followed by rural and urban areas. It was more common in industrial areas. In the social perception of drug abuse, alcohol was accepted as a social evil, *bhang* accepted by some while *ganja* smoking was stigmatised. Dependence was seen mostly in males and there was caste and community preferences in drug abuse. In a similar survey in Lucknow⁴, a prevalence rate of 18.55/1000 was found, with Muslims accounting for 41.54 per cent of alcohol abusers. In a study of the rural population in Bengal⁵ addiction to alcohol and drugs was seen in 1.3 per cent of the population. Other community prevalence surveys⁶⁻⁹ have reported addictive abuse of alcohol to vary between 0.2 and 4.8 per 1000 population.

Drug addiction in general population:

The second category of studies are those which deal specifically with drug addiction in the general population. The study team on prohibition¹⁰ made an attempt to study drinking patterns in India. It analysed the budgets of 21,197 working class families collected by the Labour Bureau of the Ministry of Labour and Employment in 50 different centres, spread over all the states of the country. It showed that between 10-24 per cent of all working class families were given to or reported drinking. Considering the wet and dry areas of the country together, 12 per cent of the families reported drinking. The percentage of families drinking was lowest among factory workers (9.6 per cent), higher amongst plantation workers (14 per cent) and highest among mine workers (23 per cent). These families, on an average were observed to spend 9 per cent of their earnings on alcohol. The national sample survey found that urban families spent much more than the rural on alcohol and that expenditure on drinking was above average in north-west India, and below average in west and south India. Among socio-demographic correlates, the prohibition team felt that increased consumption in urban areas was more a trend towards pseudo-westernisation.

In a study of selected villages in Punjab¹¹ alcohol abuse was found in 74 per cent of all adults above the age of 15 years. The per capita expenditure on alcohol was Rs.2000/- per annum.

A study of drug abuse in villages of Sangrur district of Punjab (unpublished data) revealed an overall prevalence rate of 28.7 per cent (in population aged 10 years and above). Tobacco abuse was the highest (40 per

cent of the population), followed by alcohol (25.55 per cent), opium (18.9 per cent), barbiturates (6.2 per cent) and cannabis (2.2 per cent). Majority of the opium abusers were dependent on the drug. It was seen mostly in males. Alcohol abuse started earlier in life and preceded the abuse of opiates. The drug abuse was more prevalent in farm labour as opposed to people with more sedentary professions.

Drug addiction in students:

The third category of studies is restricted to the student population. In a study of 1,132 students in Calcutta University¹² a prevalence of abuse of tobacco in 26 per cent and amphetamines in 11.4 per cent was found. A survey conducted in selected colleges of Delhi¹³ showed a prevalence rate of 24.7 per cent. Tobacco abuse was highest, followed by alcohol, tranquillisers, amphetamines, opium and barbiturates. A similar study among Bombay University students¹⁴ revealed a prevalence of 19.7 per cent. The most commonly abused substance was cannabis followed by amphetamines, barbiturates, LSD, opium, heroin, cocaine and morphine. A study from Chandigarh (unpublished data) found a prevalence rate of 18.87 per cent among the students. The most commonly abused substance was amphetamines, followed by mandrax, cannabis and barbiturates. In an English medium boys' school in Delhi a prevalence rate of 32.2 per cent was found¹⁵. Tobacco abuse was highest followed by alcohol and cannabis.

A study¹⁶ in which 100 core drug abusers were studied with regard to the drugs taken, socio-economic background, pocket money, the topics being studied and personality make up, showed that more than 70 per cent belonged to the higher economic strata, receiving pocket money of Rs.150-200 per month and studied in the Arts group. Most of them had certain personal and social problems which induced drug abuse. *Panwallahs*, *dhobis* and friends were reported to be the main sources of drug supply.

A pilot survey was conducted under the aegis of the Council to determine the pattern and prevalence of drug abuse in the students of Delhi University. The survey explored the role of the twin variables of sex and attachment of hostel in relation to drug abuse. In addition, it included items on socio-demographic correlates and incorporated personality measurements. The survey estimated that the prevalence rate of drug abuse in both

men and women students was 32.7 per cent. It was significantly more in men (45.7 per cent) as compared to women (18.3 per cent) and in institutions with attached hostels. The incidence of drug abuse, when alcohol and tobacco-the most commonly abused drugs-were excluded, fell to 23.8 per cent in males and 10.5 per cent in females. In males, the third most commonly abused drug was cannabis while in females it was analgesics. The fourth most commonly abused drugs in both was tranquillisers. In males, other drugs abused were amphetamines, barbiturates, opiates, LSD and cocaine, in that order. In females, the other drugs abused were negligible. No exclusive opiate abusers were seen. The majority of the students abused drugs in a casual experimental manner. The total number of addicts in this study identified on the basis of craving response was 38 males and 4 females giving a prevalence rate of 8.4 per cent. Excluding alcohol and tobacco, the prevalence rate worked out to 2.2 per cent. Among the socio-demographic correlates significant associations were seen with nuclear family structure, high parental income and education. In addition, the drug users fell in the normal introverted quadrant of E.P.I. (Eysenck's Personality Inventory) which was in keeping with the experimental nature of drug abuse. This survey highlighted some of the methodological issues related to questionnaire studies in drug abuse. Major ones amongst these were problems concerned with over responders, false responders and under responders. Valuable information was gained regarding the ideal size and presentation of the questionnaire.

Clinical studies on adverse drug effects:

The fourth category of studies have originated from clinical set-ups and deal with adverse effects of drug abuse. Most of these studies have explored the adverse effects of cannabis as this is the culturally sanctioned drug of abuse.

Dhunjibhoy¹⁷ reported that following cannabis intake, hemp psychosis resembling acute or chronic mania, could occur. In a study of drug habits in normal and mentally ill patients¹⁸, it was observed that drug indulgence was decidedly more in manic depressive psychosis and schizophrenia than in any other category and that the mentally ill tended to abuse drugs indiscriminantly while normal persons in the habit of drug abuse exercised a specific choice. It was seen that there was a higher prevalence of drug abuse

among psychotics as compared to psychoneurotics. Although the difference was not significant the neurotics showed drug habit to a lesser extent than the normals. A study from Agra showed that of 368 consecutive admissions to the mental hospital, 100 were habitual drug users. Cannabis was found to be the commonest drug abused, followed by alcohol. It was seen that abusers were mostly younger in age and started drug intake in early life usually before 30 years of age. In another study¹⁹ cannabis abuse was seen in 3.2 per cent of the total of 39,001 patients admitted to a mental hospital over a period of 10 years, while in other studies²⁰ it was found in 23.67 per cent of 566 consecutive admissions. Acute toxic psychosis lasting for few hours or days, more frequently with persons using potent cannabis preparations has been reported²¹. However, three studies²²⁻²⁴ on heavy cannabis abusers did not report any case of cannabis psychosis.

It is often said that the popular drugs of abuse in the Indo-Pak sub-continent have been cannabis and opium, especially in the rural population. However, recent reports indicate that contrary to this belief, alcohol is the most popular addictive substance abused and has replaced cannabis and opium. The popularity of alcohol has been clearly brought out by psychiatric morbidity studies as well as surveys on the student population. Indeed, from the studies in Punjab, it appears that considerable benefits of the "green-revolution" are being diverted to alcohol consumption.

The best guide to the problem of drug addiction in terms of those who are confirmed addicts are the psychiatric morbidity prevalence surveys. These surveys have consistently shown that the most common addiction is that of alcohol and addiction to all other drugs, especially opiates, is comparatively insignificant if not absent. However, the use of opiates and cannabis has been an acknowledged facet of Indian life and as the Punjab study shows, the percentage of population abusing opiates is likely to be much higher than the current official estimates. This brings us to the interesting question of cultural tolerance of drug abuse. The percentage of persons abusing opiates could be much higher than the official estimates, and they may also be "addicted" according to the medical criteria but it does not necessarily imply that they are not socially integrated. In other Asian countries, such groups of persons were prohibited from abusing opium and en-

forcement machinery was brought in with the result that opiates were replaced by harder synthetic drugs like heroin.

The studies conducted on student populations in India suggest the range of drug abuse and do not essentially reflect the extent or magnitude of addiction. The significant trends which emerge are that (i) drug abuse is mostly confined to licit drugs, (ii) the manner of use is experimental and recreational, (iii) even if licit drugs are included in the range of drug abuse, more than 50 per cent of boys and 82 per cent of girls are totally abstinent; all this is in marked contrast to the phenomena and the prevalence and pattern of drug abuse in other countries, Western as well as Asian, where there is widespread heroin and related drug abuse.

There is some evidence to suggest that psychotropic drugs are being leaked into illicit channels. The reasons for this could be many. Firstly, it is possible that these drugs are being over-promoted and hence over-prescribed by the medical fraternity; thus a minor tranquilliser may be manufactured by two or three competing firms, who tend to promote their sales by increasing the range of indications for which it can be prescribed. A careful scrutiny would show that the only effective indication for the drug would be manifest anxiety symptoms rather than inferred anxiety as in psychosomatic illnesses. The medical profession also tends to prescribe these drugs in a more blanket fashion. Secondly, though the sale of these substances is regulated (legally) by prescription, they are not as vigorously applied as for narcotics. Since India is a signatory to the International Psychotropics Convention, this is an area which would need careful and stricter regulation.

Despite all these surveys there are still certain lacunae in the information on drug abuse in India. There are, for example, a large number of substances with the potential of abuse, which are freely available. The volatile solvents, petrol, glue, paint thinners etc. have not yet made their appearance on the addictive scene, but can do so in future. Also, no longitudinal studies on the prevalence and pattern of drug abuse are available, except perhaps from Delhi, and hence it is very difficult to comment on changing trends. Very few studies have dealt with the basic biological research issues, and none has evaluated treatment approaches. There are no studies available on the addictive potential of indi-

genous drugs. The information relating to drug abuse is scattered over too many disciplines and agencies without meaningful co-ordination or communication. There is also a need for the evolution of uniform methodologies for data collection so that the results are comparable not only across the country, but also over a period of time.

In view of the importance and the growing concern over the problem of drug addiction in the country, the National Drug Addiction Committee was appointed by the Government of India to go into the extent and incidence of drug abuse with particular reference to the student community. The Committee has 11 members derived from different fields such as Education, Mental Health as well as from the Drug Controller's Organisation and the Narcotics Commission. The Committee has taken up an in depth study of drug abuse among students in many cities. It is also attempting to obtain information from Drugs Controllers from different States of the country with regard to the enforcement of laws pertaining to this problem. The Committee has also contacted psychiatrists from different parts of India in order to obtain information on treatment and rehabilitation of drug addicts/drug abusers. In order to get first-hand information on the problem of drug abuse the Committee has also met and interviewed various categories of officials and individuals. A questionnaire has also been sent to the Vice-Chancellors of various Universities in India seeking their opinion on the problem of drug abuse in the student community.

The Committee is expected to submit its report to the Government of India this year.

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ABSTRACTS

Some Research Projects completed recently

A study of the fibrinogen turnover in experimental atherosclerosis and arteriosclerosis and the possible effects of selective fibrinogen depletion in the evolution of these lesions

It has often been suggested that thrombosis is an important initiating factor in the causation of atherosclerosis. A study was undertaken to evaluate this concept by studying the behaviour of fibrinogen, the essential substrate for thrombosis, and also the effect of reduction of the quantity of the substrate in rabbits rendered atherogenic by feeding cholesterol.

Atherosclerosis was produced in two groups of rabbits by feeding cholesterol and saturated fats for a period of 2 months and 5 months respectively. In the latter group cholesterol feeding was intermittent during the last 3 months.

Isotopic labelling of fibrinogen with ^{125}I was carried out using chloramine-T. The half life of labelled fibrinogen in the two groups of cholesterol fed animals was 52.05 and 51.5 hours respectively, which was not significantly different from the normal values in this laboratory.

Selective fibrinogen depletion was pro-

duced in the two groups by injecting Arvin (purified protein derivative of the venom of Malayan Pit Viper) twice daily. The blood fibrinogen was maintained around 100 mg per cent for a period of 8 weeks. The lipid profile and haematological parameters (except the blood fibrinogen levels) of these animals were no different from those of the control animals fed on a similar dietary schedule. The gross appearance of the aortae was also identical. Histopathological studies did not reveal any significant differences.

It was concluded that intravascular thrombosis probably does not contribute significantly towards the evolution of atherosclerosis when this was induced by feeding cholesterol and saturated fats to rabbits.

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Publication:

Moza, A.K., Kumar, M. and Sapru, R.P. Satisfactory radioiodination of rabbit fibrinogen using Chloramine-T. *J. Lab. Clin. Med.* 87: 169, 1976.

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gation. The resistance transfer is determined by an extrachromosomal genetic element (plasmid or episome) termed the R-Factor, which consists of several 'r-determinants', each conferring resistance to one antibiotic, and the 'resistance transfer factor' (RTF) which enables the transfer to take place.

Transferable drug resistance is now recognised as the most important mechanism of drug resistance in Gram-negative bacilli, particularly intestinal bacteria. Such resistance is frequent among the commensal intestinal flora. When these resistant strains infect the urinary tract or other sites, antibiotic therapy may not be effective. A more important problem is the spread of R-Factors to primary intestinal pathogens such as shigellae rendering them refractory to antibiotic therapy. Widespread outbreaks of bacillary dysentery caused by such drug-resistant shigellae have been reported in recent years from Central and South America and Bangladesh. Localised outbreaks have occurred in India also. The most important danger of transferable drug resistance is its spread to intestinal bacilli that cause invasive or systemic disease.

While R-Factor had been observed with increasing frequency in salmonellae causing food poisoning or gastroenteritis, it had not spread to *Salmonella typhi*. It was therefore postulated that *S. typhi* was a poor acceptor of R-Factor and hence may not become resistant. However, in 1972, outbreaks of chloramphenicol-resistant typhoid fever occurred in Mexico and Kerala. Similar outbreaks have since been reported from many parts of South East Asia.

At Calicut, *S. typhi* strains have been monitored for drug resistance since 1968. Till 1971, no instance of multiple drug resistance was encountered in *S. typhi* isolates, though R-Factors conveying resistance to chloramphenicol (C), streptomycin (S), sulphonamide (Su) and tetracycline (T) were common in commensal intestinal bacilli as well as in urinary pathogens. It was also found that resistant *Escherichia coli* isolated locally could transfer their resistance *en bloc* to local isolates of *S. typhi* by conjugation *in vitro*. This suggested the possibility of drug resistant *S. typhi* strains emerging by similar conjugation in the gut.

In May 1972, for the first time, a strain of *S. typhi* resistant to chloramphenicol was isolated from the blood of a typhoid patient

who had not responded to chloramphenicol therapy. The resistance was of a high order (chloramphenicol M.I.C. 500 mcg/ml as against 2-5 mcg with sensitive strains), to multiple drugs, and transferable. This marked the beginning of an outbreak of chloramphenicol-resistant typhoid fever in Calicut. Of the 114 strains of *S. typhi* isolated subsequently in the same year, 60 (52.6 per cent) were resistant. The resistant strain has become endemic in this area and since 1972, a varying proportion of strains isolated every year has shown resistance. The incidence of resistant strains was low in 1973-1975 (10 per cent to 14 per cent), but in 1976 there was an increase, 39 per cent of the isolates being resistant.

In vitro drug resistance has paralleled clinical resistance. Chloramphenicol was found ineffective in typhoid cases caused by resistant strains. Co-trimoxazole has been very useful in such situations.

The resistance pattern has been uniform throughout the last 5 years, the R-Factor mediating resistance to CSSuT and belonging to the plasmid group H₁. But now there has occurred a change in the phage type of the resistant strain. While all resistant strains were of phage type D1 N, biotype I till December 1974, they have since then become phage type C₅, biotype II.

For nearly 5 years since its appearance, drug resistant strains were confined to north Kerala. However in recent months, they are being encountered in small numbers in other parts of India also. This is an ominous sign.

Transferable drug resistance is very frequent in Gram-negative bacilli causing urinary infections. R-Factors were found in drug resistant urinary pathogens with the following frequency: *Klebsiella* - 73.4 per cent, *E. coli* - 48.3 per cent, 'Paracolons' - 72.7 per cent, *Proteus* - 27.9 per cent, *Ps. aeruginosa* - 1.3 per cent.

R-Factors were also very common in the commensal intestinal bacteria: *Klebsiella* - 81.5 per cent, *E. coli* - 68.0 per cent, 'Paracolons' - 62.5 per cent, *Proteus* - 73.9 per cent, *Ps. aeruginosa* - 12.5 per cent.

In order to assess the prevalence of R-Factors in relation to the exposure to antibiotics, a comparative study was made, testing for transferable drug resistance in the intestinal flora of three populations, viz.

children in rural, urban and hospital environments. Multiple drug resistant bacteria were found in 66 per cent of rural, 88 per cent of urban and 96 per cent of hospital samples. A greater difference was noticed in the frequency of R-Factors in the three populations, 31.8 per cent in rural, 47.7 per cent in urban and 85.3 per cent in hospital strains.

The frequency of R-Factors is directly proportional to the extent of antibiotic use. It is therefore important that antibiotics be handled with restraint lest further spread of R-Factors render them totally ineffective.

Highlights of some aspects of transferable drug resistance in salmonellae in India

Dr. K.B. Sharma, Prof. of Microbiology, Lady Hardinge Medical College, New Delhi also highlighted some aspects of the work on transferable drug resistance in salmonella, being conducted in his department.

The presence of multi-drug resistant R-Factors in *S. typhi* was reported for the first time in India at Calicut in 1972. The focus has remained active and localised at Calicut since then; the original strain of Vi I phage type D₁N was, however, replaced by another R-Factor containing multi-drug resistant strain of *S. typhi* belonging to Vi II phage type C₅ towards the end of 1974, though the characters of the R-Factor remained the same.

In the year 1976, multi-drug resistant R-Factor containing *S. typhi* were encountered at various centres viz. Trivandrum, Bombay, Madurai and Ernakulam. Though single strains were encountered at the other centres, Ernakulam experienced a prolonged outbreak which started in May 1976, which has lasted up to the present and 30 strains of Vi II phage type A have been received by the Centre at Lady Hardinge Medical College. The characters of R-Factors from all these centres are similar, though different phage types were encountered.

R-Factors determining multi-drug resistance were also encountered in other salmonellae.

Since October 1975, more than 200 strains of *S. newport* were isolated from cases of neonatal septicemia in Delhi, carrying a high fatality rate. These were mainly resistant to ampicillin, chloramphenicol, kanamycin and tetracycline. The R-Factor of *S. newport* differed in several characters from those of *S. typhi* and other salmonellae found elsewhere. In 1976 from Bombay, R-Factor carrying strains of *S. paratyphi B* were isolated from 2 cases (one of which was fatal), and one strain of *S. alachua* from a fatal case of neonatal septicemia. One strain of *S. enteritidis* carrying R-Factor was isolated from blood culture of a case of septicemia in Calicut in October 1975. However, the characters of R-Factor of this strain were quite different from those of *S. typhi* endemic in Calicut. Recently in November, 1976 two strains of *S. paratyphi A* were encountered in Madras, which also carried R-Factors.

The increasing incidence of isolation of R-Factor carrying intestinal pathogens is certainly an ominous sign. Since there can be an interspecies transfer to these plasmids, the R-Factor usually gets transferred from a commensal organism such as *E. coli* to the intestinal pathogens. The risk to man does not, therefore, depend only on the transmission to man of drug-resistant pathogens, but also on that of drug-resistant non-pathogenic intestinal bacteria, which can be freely communicated from animals to man. Indiscriminate use of antibiotics in man and animal husbandry leads to the selection of such organisms.

The time has come to initiate a surveillance programme for transferable drug resistance and to initiate a national antibiotic policy with regard to antibiotic use in clinical medicine, veterinary medicine and as growth factors in animal husbandry. In this regard, the medical and veterinary professions as well as Pharmaceutical manufacturers bear a heavy responsibility. There has to be a co-operation between all the three and the Government to reverse the change in ecology of pathogenic enteric bacteria, which has resulted from an indiscriminate use of antibiotics.

SUMMARY OF DR. KAMALA MENON MEDICAL RESEARCH AWARD (1976) ORATION

Dr. Shanti Ghosh, Head, Department of Pediatrics, Safdarjang Hospital, New Delhi, delivered the Dr. Kamala Menon Medical Research Award (1976) Oration on 'Problems of low birth weight babies' at the Indian Council

of Medical Research, New Delhi on 18th February, 1977.

In India about 10 per cent of newborn babies are underweight and there is a much

higher mortality and morbidity among them. Perinatal mortality is directly related to low birth weight and lower gestation. The reasons for this lie in poor maternal nutrition and a high infection rate -the result of poor living conditions, lack of knowledge and low income.

A study of the pattern of intrauterine growth of babies at the Safdarjang Hospital showed that for the first 35 weeks, the curves were the same as those of more affluent countries, but the growth rate becomes less after that period. This evaluation was also carried out among the high socio-economic group women in a community study, and the same trend was seen though to a lesser degree.

The rate of intrauterine growth influenced morbidity and mortality at all gestations, minimum problems being found in those appropriate for gestation, the problems becoming progressively more both in babies with retarded and enhanced growth rates. The major causes of morbidity in small for date babies were asphyxia, pulmonary causes including haemorrhage and hypoglycaemia, while in the preterm babies it was due to intracranial haemorrhage, asphyxia and birth trauma.

Mortality in these babies has been reduced considerably with the early diagnosis and treatment of infection using gastric cyto-

logy as criterion of infection and also by a planned early discharge. The study also demonstrated that these simple devices could be practiced even in small district hospitals and Health Centres.

In another study, low birth weight babies were studied longitudinally for their growth and development from birth to six years. It was found that while their growth velocities were almost similar, their growth curves did not catch up with those of normal babies. When the preterm and small for date babies were compared, the preterm babies showed a much better catch up in growth and also showed the same pattern as that of the normal babies. Their development was within the normal range even though there were rather more babies with a lower I.Q. level. On the whole, there was no developmental handicap.

Growth studies carried out in high socio-economic group children, from birth to 16 years showed that the 50th centile of growth curves for weight and height were close to the 25th centile of Harvard curves. Indian children showed the adolescence spurt 1-2 years earlier than American children.

Children from lower socio-economic groups showed considerable handicap in all parameters of growth as compared to the higher socio-economic group children.

ICMR NEWS

Dr. T.A. Lambo, Deputy Director General, WHO, visited the Indian Council of Medical Research on 5th February, 1977, where he addressed senior scientists and the Directors of the Permanent Institutes of the Council. Dr. Lambo indicated that the WHO was interested in promoting the philosophy of self reliance in developing countries by improving the mechanism of coordinated research into regional problems. With this in view the WHO had established Regional Advisory Committees on Medical Research to identify and formulate research proposals depending on the regional problems and priorities. Dr. Lambo hoped that the Indian Council of Medical Research would play a major role in promoting intercountry research programmes on regional problems.

The Scientific Advisory Board of the Indian Council of Medical Research met in New Delhi on 7th February, 1977.

Dr. C. Gopalan, Director-General, Indian Council of Medical Research, chaired the meeting of the WHO Study Group on Malaria at the WHO Regional Office, New Delhi, between 9th and 16th February, 1977.

Dr. C. Gopalan delivered the Second Mellanby lecture at the Central Drug Research Institute, Lucknow and the Dr. M.B. Lal Oration at the K.G. Medical College, Lucknow, on 17th February, 1977.

Dr. M.K. Raina, Research Officer, Indian Council of Medical Research, participated in the UNESCO sponsored Third Asian Symposium on Medicinal Plants and Spices held at Colombo, between 6th and 12th February, 1977.

Dr. M.S. Bamji, Assistant Director, National Institute of Nutrition, Hyderabad, participated in the meeting of the Steering Committee of

the Task Force on Oral Hormonal Contraceptives, held at Geneva between 22nd and 28th February, 1977.

Dr. M.S. Bamji, Assistant Director, National Institute of Nutrition, Hyderabad and Dr. U.M. Joshi, Senior Research Officer, Institute for

Research in Reproduction, Bombay, participated in a WHO meeting on 'Effects of oral contraception in the presence of deficiency and disease states: Vitamin studies', held at Geneva between 28th February and 2nd March, 1977.

ICMR AIDED SYMPOSIA/SEMINARS/WORKSHOPS

A Symposium on 'Carcinoma breast and its Comprehensive Approach' was held in connection with the 30th Annual Congress of Radiology at Chandigarh, between 1st and 4th January, 1977.

A Symposium on 'Atherosclerosis' was organised during the 3rd Annual Conference of the Association of Biochemists of India at the Medical College, Baroda, between 7th and 9th January, 1977.

A symposium on 'Nutrition and Functional Performance' was organised by the Nutrition Society of India, at the National Institute of Nutrition, Hyderabad on 28th January, 1977.

The Indian Council of Medical Research National Workshop on 'Newer perspectives in microbiological investigations of streptococcal infections and their sequelae', is being held at the Lady Hardinge Medical College, New Delhi between 21st and 26th February, 1977.

An International Symposium on 'Venom and Toxins' is being organised by the Haffkine Institute, Bombay between 4th and 6th March, 1977.

A workshop on 'Non-cirrhotic portal fibrosis' is being organised by the Department of Pathology, University College Of Medical Sciences, New Delhi, in February/March, 1977.

As part of the fifth All India Conference of Physical Medicine and Rehabilitation, symposia on various aspects of Rehabilitation Medicine are being organised at the Medical Rehabilitation Centre, Patna between 20th and 22nd March, 1977.

A workshop and a symposium on 'Hospital infections with special reference to *Pseudomonas aeruginosa*' are being organised by the Department of Microbiology, All India Institute of Medical Sciences, New Delhi between 23rd and 31st March, 1977.

COUNCIL'S TRAINING PROGRAMMES FOR 1977

Leprosy:

At the Central Jalma Institute for Leprosy, Agra.

Training course in Leprosy for medical officers: (December, 1977).

Virology:

At the Virus Research Centre, Poona.

- (1) Diploma course in Virology of Poona University: (July, 1977).
- (2) *Training Course for Technicians for a period of one year.
- (3) Short-term course in Tissue Culture: (June 13 to 26, 1977).

Amoebiasis:

At the School of Tropical Medicine, Calcutta.

*Technicians Training Course in Amoebiasis.

Reproductive Biology:

At the Institute for Research in Reproduction, Bombay.

- (1) Course on Immunological Techniques: (February, 1977).
- (2) Course in Hormone Assays: (March, 1, 1977 to April 30, 1977).
- (3) Course in Endocrinology and Fertility Control: (September, 1977).

- (4) Course on Human Cytogenetics: (September, 1977).
- (5) Course in Reproductive Biology and Fertility Control: (November, 1977 to February, 1978).

Nutrition and Endocrinology:

At the National Institute of Nutrition, Hyderabad.

- (1) Annual certificate course in 'Endocrinological Techniques and their Application: (August, 1977 to September, 1977).
- (2) Annual certificate course in Human Nutrition for Teachers in Agricultural Universities: (August, 1977 to October, 1977).
- (3) M.Sc. (Applied Nutrition) course: (June, 1977 to February, 1978).
- (4) Annual certificate course in Nutrition: (December, 1977 to February, 1978).

Haematology:

At the Blood Group Reference Centre, Bombay.

- (1) A certificate course in Blood Banking Technology and Basic Haematology for medical officers: (February 1, 1977 to March 31, 1977).
- (2) Training course in Blood Banking Methodology for Technicians: (May 2 to May 14, 1977).

Occupational Health:

At the National Institute of Occupational Health, Ahmedabad.

- (1) *ICMR/WHO training course in Industrial Toxicology.
- (2) *Refresher course in Occupational Health for E.S.I. medical staff.
- (3) *Training course on Chemical Hazards in Chemical Industry organised jointly by the NIOH and the National Safety Council.

Clinical Pharmacology:

At the Department of Pharmacology, Seth G.S. Medical College, Bombay.

Training course in Clinical Pharmacology: (January 15 to February 28, 1977).

Biostatistics:

At the National Institute of Nutrition, Hyderabad.

Annual Training course in Biostatistics for Statisticians: (November, 1977).

Laboratory Animal Technology:

- (1) At the Virus Research Centre, Poona.
Short-term course in Breeding and Maintenance of Laboratory Mouse Colonies: (March, 1977).
- (2) At the National Institute of Nutrition, Hyderabad.
Laboratory Animal Technicians Training Course: (August, 1977 to September, 1977)

COURSES FOR TALENT SEARCH SCHEME FELLOWS:

Immunological Techniques:

At the Department of Biochemistry, All India Institute of Medical Sciences, New Delhi: (January 24, 1977 to February 5, 1977).

Clinical Chemistry and Instrumentation:

At the National Institute of Nutrition, Hyderabad: (February 28, 1977 to March 12, 1977).

Cell-Biology and Cyto-Genetics:

At the Indian Institute of Science, Bangalore: (June 29, 1977 to July 12, 1977).

***Haematological Techniques:**

At the Department of Haematology, Post-graduate Institute of Medical Education and Research, Chandigarh.

***Principles and Methods in Medical Statistics:**

At the Tuberculosis Chemotherapy Centre, Madras.

***Clinical Pharmacology:**

At the Department of Pharmacology, Seth G.S. Medical College, Bombay.

*Dates to be announced later.

SCIENTIFIC LECTURES TO BE HELD AT
INDIAN COUNCIL OF MEDICAL RESEARCH, NEW DELHI DURING
FEBRUARY AND MARCH, 1977

Date	Topic	Speaker
18.2.1977	Problem of Low Birth Weight Babies (Dr. Kamala Menon Medical Research Oration, 1976)	Dr. Shanti Ghosh, New Delhi.
4.3.1977	Breast milk and defence against infection	Dr. Vinodini Reddy, Hyderabad.
18.3.1977	Mycotic Infections in India (Dr. Y.S. Narayana Rao Oration, 1976)	Dr. L.N. Mohapatra, New Delhi.

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Statement about ownership and other particulars of the ICMR Research Information Bulletin as required under Rule 8 of the Registration of Newspapers (Central) Rules 1956.

Place of publication	Indian Council of Medical Research Ansari Nagar, New Delhi-110016.
Periodicity of publication	Monthly
Printer's Name	Shri Prem Chand
Nationality	Indian
Address	Administrative Officer Indian Council of Medical Research Ansari Nagar, New Delhi-110016.
Publisher's Name	] Same as above]]
Nationality	
Address	
Editor's Name	Dr. G.V. Satyavati
Nationality	Indian
Address	Indian Council of Medical Research Ansari Nagar, New Delhi-110016.

I, Prem Chand hereby declare that the particulars given above are true to the best of my knowledge and belief.

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Publisher

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Printed and Published by Shri Prem Chand for the Indian Council of Medical Research, New Delhi at the ICMR Offset Press, New Delhi.

R.N. 21813/71