

COMMUNITY HEALTH CELL
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A COMPREHENSIVE APPROACH FOR FERTILITY CONTROL

The Council's Expert Committee on Reproductive Biology and Fertility Control at its meeting held earlier this year had identified five high priority areas of research. The Committee recommended that independent study groups should meet to review the present state of research and to formulate specific guide lines as to the direction and organisation of future research, relevant to the current national context and needs. The high priority areas thus identified were:

- (i) Control of fertility in the female
- (ii) Control of fertility in the male
- (iii) Antifertility agents
- (iv) Abortion
- (v) Acceptance of fertility control methods

The respective Study Groups on the above, met independently at the ICMR, New Delhi, in September, 1976.

CONTROL OF FERTILITY IN THE FEMALE:

Various aspects and methods for fertility control in the female were discussed. The current status and potential areas of research for non-surgical methods of tubal occlusion were first discussed; the areas suggested included development of a bipolar electrode, indigenous manufacture and maintenance facilities for endoscopic instruments, development of sclerosing agents and vehicles. It was recommended that initially, those agents (e.g.

quinacrine, chloroquine, urea and lipiodol) for which toxicity and safety limits have already been established, be investigated. The necessity for development of a suitable animal model for evaluating the local and systemic toxicity and sequelae and testing of delivery systems for instillation by the transcervical and transperitoneal routes, was emphasized. It was also felt that reversible procedures (surgical or nonsurgical) for tubal occlusion be tested in animal models or in the clinical field.

The endoscopic methods of sterilization were next discussed. It was felt that evaluation of the short and long-term sequelae of minilaparotomy, laparoscopic coagulation and vaginal colpotomy and culdoscopy be included in the study on sequelae of tubal sterilization. The scope and demand for recanalisation were also discussed.

The possible role of the pre-implantation embryo in the control of early pregnancy by prevention of implantation was also discussed, followed by a discussion on the role of luteolytic agents in the control of fertility. It was felt that the most promising area for investigation in this field was the follicular fluid (preferably bovine) for presence of inhibitor activity, its nature, species specificity and effect on corpus luteum function.

With a view to developing methods of passive immunization for the early termination of pregnancy it was suggested that studies on placental antigens (HPL, HCG and 'Pregnancy Protein' in serum) and species specific anti-

gen in the uterine secretion during the secretory phase, be conducted.

Fertility regulating methods for lactating women were discussed at great length as this was felt to be an area of high priority. The various aspects discussed were lactational amenorrhoea and pregnancy rates in lactating women in different samples of the population; the effect of contraceptives (hormonal and IUDs) on the volume and constituents of breast milk; the excretion of commonly used steroids and their metabolites in breast milk and their biological effects. It was further suggested that animal experiments be conducted to obtain data on growth, development, sexual maturation and behavioural abnormalities following the administration of steroids to lactating mothers.

Finally the natural methods of family planning and their place in family planning clinics were also discussed.

Research Recommendations:

1. Development of non-surgical methods for tubal sterilization.
2. Retrospective study to evaluate the scope and demand for tubal recanalization.
3. Studies on lactational amenorrhoea and pregnancy rates with the objective of developing suitable fertility regulating methods for lactating women.
4. Safety studies with regard to excretion and biological effects of steroids and their metabolites in breast milk.
5. Clinical evaluation of IUDs introduced immediately after the third stage of labour.
6. Basic studies on cervical factors to examine the potentiality of predetermination of sex as claimed by the natural family planning method.
7. Studies on pre-implantation embryo with a view to controlling fertility by inhibiting hormone synthesis and enzyme activity at that stage.
8. Studies on bovine follicular fluid for the presence of a substance which would inhibit oocyte meiosis and affect corpus luteum function.

9. Studies on uterine and placental specific antigens for developing methods of passive immunization for the interruption of pregnancy.

CONTROL OF FERTILITY IN THE MALE:

Several papers dealing with various facets of fertility control in the male were presented and discussed in depth. It was recommended that the short (post-operative) and long-term (endocrinal, immunological and psychological) sequelae of vasectomy be investigated in detail as this method for fertility control was being widely advocated and practised. Anticipating that the number of requests for reanastomosis of the vas would increase in the near future, the group expressed the need to simplify and perfect techniques for reanastomosis and to investigate the causes of infertility following successful reanastomosis, with special reference to the changes in vasal physiology, immunological factors and constituents of the seminal fluid which may interfere with the fertilizing ability of spermatozoa.

In the area of non-surgical occlusion of the vas it was suggested that multi-centric trials be conducted with tantalum clips, intra-vasal (silk thread or copper) devices and sclerosing agents (preferably in combination with biodegradable polymers).

The hormonal regulation of spermatogenesis was discussed at length. The role of inhibin in the control of FSH secretion, its source (cell type), biological effects in rodents and primates and the species specificity were also discussed, as also the possibility of neutralization of circulating FSH by passive or active immunization. The suppression of pituitary gonadotrophins by oral or intranasal progestins was also mentioned.

As recent studies have focussed attention on the epididymis as an extra-testicular site for fertility control, it was felt that the hormonal and non-hormonal factors regulating epididymal functions be studied in detail.

The other aspects discussed were the hormonal factors (particularly prolactin) regulating the secretory functions of the accessory glands and the possible role of prolactin in spermatogenesis; factors responsible for spermiation in human beings and other mammals; characteristics of androgen

binding protein (ABP) in human and sub-human primate testes and analysis of rete testis fluid and its alteration with a view to render it hostile for spermatozoa.

Research Recommendations:

1. Short and long-term sequelae following vasectomy.
2. Studies on reanastomosis of the vas.
3. Multicentric trials with tantalum clips, intravasal devices and sclerosing agents for vas occlusion.
4. Basic studies on blood supply, innervation and biochemistry of human vas deferens.
5. Hormonal regulation of spermatogenesis including studies on inhibin; neutralization of circulating FSH by passive or active immunisation; suppression of pituitary gonadotrophins by steroids.
6. Study on prolactin as a hormone regulating secretory functions of the male accessory glands and spermatogenesis.
7. Study on factors responsible for spermiation in human and other mammals.
8. Characterization of androgen binding protein (ABP) in human testis.
9. Canalization of rete testis in monkey and human and analysis of its constituents with a view to develop fertility control agents which would act at that level.

ANTIFERTILITY AGENTS:

Indigenous plant materials and their effects on the male and female reproductive systems with special reference to regulation of fertility were discussed at length. Details of the methodology for pre-clinical and clinical testing of both crude and pure products were presented. The importance of a standardized (uniform) methodology was stressed. It was felt that apart from variations in the methodology, the other reasons for discrepancies in the results were due to poor animal house facilities, variation in the source of plant material, and differences in dosages and schedules of administration.

The work done in the identification and testing of plant products with spermicidal

action was highlighted. Other presentations emphasized the basic aspects relating to effects of antifertility agents on the pituitary gonadal axis, post-coital phenomenon and the effect of psychoactive drugs on reproduction.

Research Recommendations:

1. Investigations on the antifertility effects of plant and other indigenous products at 3 levels viz.
 - (a) Preliminary quick screening of products by reputed traditional practitioners.
 - (b) Modified screening procedures for products proved to have antifertility effects.
 - (c) Screening of extracts and synthetic compounds.
2. Specific studies on plants showing spermicidal activity.
3. Development of biodegradable polymers as carriers of contraceptive drugs of plant origin.

ABORTION:

A detailed discussion was held on the termination of pregnancy between 13 and 15 weeks of gestation. It was felt that under the existing conditions, when a patient was willing for sterilization, abdominal hysterotomy with sterilization would be the most suitable method. Other methods discussed were the use of bougies, tents, extramniotic injections of various solutions and a cervical dilator containing *isapgol*.

During discussions on the termination of pregnancy in anaemic patients, it was agreed that whenever possible, termination of pregnancy in patients with Hb levels below 8 gm per cent (Sahli's method) be postponed till anaemia was treated, unless blood transfusion facilities were available at the time of termination. The difficulties experienced in defining blood loss in abortion and the actual measurement of blood loss, which varied with the method and the period of gestation, were highlighted. It was suggested that chemical methods be used for estimation of blood loss.

Other aspects discussed were the use of indigenous drugs as abortifacients, use of

prostaglandin analogues by intramuscular injections or as vaginal suppositories and the different sources of vacuum used for first trimester abortion.

Research Recommendations:

1. Clinical trials with *Isapgol* dilator developed by CDRI, Lucknow.
2. Pilot study to measure blood loss during abortion using chemical methods.
3. Pilot study on the induction of abortion using bougies.

ACCEPTANCE OF FERTILITY CONTROL METHODS:

As family planning is an essential component of national social welfare activities, in general it was felt that acceptance would be higher if workers in the field stressed the benefits that would result from its adoption, in terms of improved health and economic status of the family. The necessity for close cooperation with social scientists was also stressed. The Group recognised the fact that changing cultural values had resulted in changes in the acceptance pattern especially with reference to methods of contraception in the male.

The discussion on factors affecting acceptance by females brought out the fact that in the Indian situation any method which significantly altered the menstrual pattern or rhythm was unacceptable, this being one of the reasons for pills and IUDs not being widely accepted. The importance of operational research to increase contraceptive acceptance was also stressed. To investigate the factors responsible for the limited

success of the IUD programme, it was suggested that a systematic study of the socio-cultural and psychological aspects of IUD acceptors and non-acceptors be carried out.

It was pointed out that though the initial acceptance of hormone methods was high, acceptance in terms of continued use was low. It was suggested that new methods of marketing and advertisement be used for furthering the continued use of hormone contraceptives.

While reviewing the acceptance of induced abortions, the Group pointed out that even though termination of pregnancy had been legalized, the number of MTPs registered were not many. Whether this was due to lack of facilities or lack of acceptance needed investigation.

Research Recommendations:

1. Questions pertaining to acceptability attributes of IUD, pills, abortion, tubal sterilization and vasectomy should, as far as possible, be included in the ongoing studies of the Council.
2. Studies to assess the utilization of workers of different categories such as dais and practitioners of indigenous medicine, for a better acceptance of fertility control methods at the rural level.

Based on the recommendations of the various study groups outlined above, the Council is now planning to undertake comprehensive studies on specific aspects of fertility control in the male and female including studies on acceptance of methods available for fertility control.

ABSTRACTS

Some Research Projects completed recently

A follow up study of 122 cases of depression

The project dealt with the study and observation on 122 cases diagnosed as Depressives. One hundred and nine cases were followed up for 3-13 years. None of these cases developed schizophrenic symptomatology and there was no recurrences in 28 cases (27.5 per cent), after the first episode of depression. Forty-two cases had a bipolar course, following the original diagnosis.

Change of polarity from depression to mania occurred in 75 per cent of the cases, within 3 years of the onset of depression. In 9 others the shift occurred between 3-12 years. Episodes of depression before the onset of mania varied from 1-3.

Patients with onset of depression before the age of 40 years were found to be more liable to recurrences.

Suicidal ideas occurred in 48 patients and attempts to commit suicide were made by 23. In one case the attempt was successful.

Eleven patients were found to develop chronicity and 6 of them showed intellectual impairment. The tendency to chronicity was more common in patients having an onset of the disease before 40. Seventy seven continued with their original jobs, 14 changed their jobs and 11 were not able to continue to work.

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A Pilot survey to determine the prevalence, nature and pattern of drug abuse among University students

A survey focussed on use and abuse of drugs (as listed in WHO Technical Report Series, 516 (1973) and excluding the Khat type and volatile solvents but including tobacco) was carried out among students of Delhi University. The objectives were to determine prevalence, nature and pattern of drug abuse and to correlate its prevalence with orientation of students towards the drug and their personality profiles.

The universe of the study comprised 1st, 2nd and 3rd year undergraduates from 4 colleges, 2 catering exclusively for men and 2 for women resident and non-resident students. Selection of students was by a systematic random technique and the sample size was 576. Data was collected by a structured questionnaire which elicited responses related to demographic characteristics, prevalence and incidence of drug abuse and personality characteristics.

The prevalence of drug abuse in male students was 45.7 per cent and that in females 18.3 per cent. The overall prevalence was found to be 32 per cent, alcohol and tobacco being the most commonly abused drugs on a regular basis and poly drug abuse appeared to be the norm.

Drug abuse was found to be higher in institutions with attached hostels and signi-

ficantly higher among students with relatively affluent and educated parents.

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A prospective study of neonatal neurological examination including electroencephalography in high risk babies and its correlation with subsequent neurological and mental development

The study involved detailed neurological examination of 195 babies having high risk perinatal factors and 42 normal babies. Examinations were carried out daily in the 1st week after birth and then weekly while the infant was in hospital. On the basis of the examination infants were classified as neurologically normal, suspect or abnormal. Besides this some babies showed transient abnormality (mid-week abnormality) often related to sepsis, jaundice or phenobarbitone therapy.

The neonatal examination showed that 100 babies were normal, 62 suspect and 16 abnormal. 17 babies showed mid-week abnormality. In the control group 3 babies were suspect and the remaining 39 were normal.

Neonatal neurological abnormality was found to be significantly related to perinatal asphyxia and was adversely affected by intra-uterine growth retardation and preterm delivery.

Ten infants of the test group showed developmental retardation. Cases neurologically abnormal in the neonatal period were found to have a 38 per cent chance of showing developmental delay at the age of 1 year. The investigators have evolved a high risk score, based on socio-economic status, response to resuscitation after birth asphyxia, birth weight, intrauterine growth and neonatal neurological examination. Fifty one per cent of the study group scored less than 40 and none of them showed signs of mental retardation. Nineteen per cent had a score of 50 or more and 70 per cent of them had evidence

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of developmental delay.

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The cerebrospinal fluid dynamics in experimental brain oedema with extradural compression

It has been reported earlier that when radio-iodinated human serum (RIHSA) is injected into the intrathecal space in human beings, the level of initial radioactivity as observed in brain scan, disappeared within 24 hours.

In this study one group of adult rhesus monkeys was given intrathecal RIHSA into the lumbar space and radioactivity measured by brain counts, blood counts and brain scans at different time intervals.

In another group of animals a balloon was implanted under anaesthesia in the parieto-temporal extradural region. After recovery of

these animals, 0.5 ml sterile normal saline was introduced daily into the balloon for 7 days to produce experimental oedema. RIHSA was then introduced into the lumbar intrathecal space and radioactivity measured.

In addition a small group of monkeys, who had been given RIHSA were kept till the radioactivity had disappeared. Cerebral oedema was then produced by balloon implants and saline injection and radioactivity measured, so that these animals acted as their own controls.

It was found that in monkeys, as compared to man, radioactivity persisted for a longer period (more than 24 hours).

Brain counts in experimental animals gave much higher values than in control ones. It was, therefore, concluded that C.S.F. dynamics appeared to be definitely increased in cerebral oedema.

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**SUMMARY OF THE CHATURVEDI KALAWATI JAGMOHAN DAS
MEMORIAL AWARD (1975) ORATION**

Prof. K.S. Mathur, Ex-Professor of Medicine, Medical College, Agra delivered the Chaturvedi Kalawati Jagmohan Das Memorial Award (1975) Oration on 'Serum Lipids and Atherosclerosis' at the Indian Council of Medical Research, New Delhi on 6th August, 1976.

The main strategic thrust to increasing atherosclerotic morbidity must be primary prevention, which depends on clear understanding of its aetiopathogenesis. It is in this context that the relationship of serum lipids and atherosclerosis has been studied.

In a study of 200 medico-legal autopsies, no correlation was observed between total serum cholesterol and aortic atherosclerosis when age factor was excluded. Highly significant correlation was demonstrated between aortic wall cholesterol and atherosclerosis in 100 autopsies. In another study of 147

aortas obtained from medico-legal autopsies no relation was observed between globulin content of intima and atherosclerosis but a direct relationship was observed between lipid and cholesterol binding capacity of intimal globulins and atherosclerosis. This suggested the possibility of qualitative change of globulins and ground substance in atherosclerosis.

The inter-relationship of serum lipids and atherosclerosis and the aetiopathogenic role of vessel wall factors were also studied in experiments designed to observe the effect of Bengal gram on atherogenesis and serum lipids in rabbits.

Atherosclerosis as well as levels of serum lipids were significantly less in rabbits fed on Bengal gram as compared to those on stock diet when both the groups of animals were given continuous cholesterol feeding for 24 weeks. Since advanced lesions

of atherosclerosis were not produced and serum lipids were markedly raised unlike what is commonly seen in men, intermittent cholesterol feeding was employed in another experiment and followed for 56 weeks. After an initial rise during cholesterol feeding, serum lipids returned to near normal values after 40 weeks in both the groups of rabbits but atherosclerosis was significantly less in the Bengal gram fed animals. This suggested that anti-atherosclerotic action of Bengal gram was not due solely to hypolipidaemia. In another study on intermittent cholesterol feeding, there was no difference in globulin content of intima in the two groups of animals and no correlation between globulin content and atherosclerosis. But there was direct relationship between cholesterol binding capa-

city of intimal globulins and atherosclerosis.

Studies on human autopsies as well as experimental animals suggest a qualitative change in the protein moiety of the ground substance in the vessel wall that plays an important role in the pathogenesis of atherosclerosis and Bengal gram may be interfering with it to partly account for its anti-atherosclerotic action.

The experimental studies have also highlighted the beneficial effect of Bengal gram as a dietary supplement when given from an early age in either preventing or delaying atherosclerosis as well as lowering the serum lipids.

SUMMARY OF LECTURE DELIVERED AT THE ICMR, NEW DELHI

LONG TERM EFFECTS OF VASECTOMY BY DR. SHANTA S. RAO, DEPUTY DIRECTOR, INSTITUTE FOR RESEARCH IN REPRODUCTION (IRR), BOMBAY, ON 29TH OCTOBER, 1976.

As vasectomy is being increasingly advocated as a method of fertility control, it has become necessary to study its long term sequelae, the occurrence of which will have a bearing on the acceptance of this method.

Two factors which have greatly influenced the acceptance of vasectomy, are the questions of (i) reversibility (ii) safety and long term sequelae.

Since 1958-59, attempts have been made for reanastomosis of the vas. A 90 per cent success rate, as indicated by the presence of spermatozoa in the semen following reanastomosis, has been reported. However, success in terms of restoration of fertility has been reported to be only about 30-35 per cent. The successful outcome of reanastomosis depends on many factors like the psychological, physiological, endocrinal and immunological status of the individual and also on the histological integrity of the gonads.

Investigations carried out in this country and elsewhere, have revealed that vasectomy does not adversely affect the psychological status if the individual is properly briefed and motivated before the operation. Research carried out at the IRR, Bombay, has

revealed that vasectomy does not adversely affect the physiological and endocrinal status of the vasectomised male. On the other hand, results of a preliminary study carried out at the IRR have indicated that vasectomy might slightly enhance androgen levels and decrease the tendency for prostatic hypertrophy.

Immunological investigations have indicated the development of humoral immunity (HI) to spermatozoa in some cases of vasectomy. Animal experiments, however, have revealed that HI to homologous spermatozoa is likely to disappear following reanastomosis. Cell mediated immune response (CMI) was seen in a small percentage of the IRR series. The incidence of HI and CMI varied in different centres because of differences in antigen, antisera and methodology used for their detection and assay. Though the development of HI and CMI to autologous spermatozoa following vasectomy is known, the exact clinical significance of this has not been established.

Evidence is now available to indicate that infection, general condition of health and environmental factors may also influence the development of HI and CMI after vasectomy. However, recent studies have indicated that neither HI nor CMI has deleterious effects on any of the bodily functions except perhaps the fertilising capacity of spermatozoa. Further intensive research is, therefore, essential to solve the queries associated with vasectomy.

SOME HIGHLIGHTS OF SCIENTIFIC ACTIVITIES

JE epidemic in Burdwan district:

The Vector Control Research Centre (VCRC), Pondicherry, investigated an epidemic of Japanese Encephalitis (JE) in Burdwan district of West Bengal this year. The epidemic was considered a serious one in that a large number of deaths occurred i.e. 61 deaths out of 169 cases reported till the end of August 1976. It was found that most of the cases occurred among the economically backward communities such as the scheduled castes and tribes, particularly the Santhals.

Though JE virus was isolated from mosquitoes collected in the year 1974 and 1975, it was of interest to note that no cases of JE were reported during these years. This might be due to the fact that the vector species breeds mainly in rain water pools and 1974 and 1975 happened to be years of lean rain fall, receiving less than half the annual quota of rains. In April 1976, on the other hand, there were cyclonic storms and heavy rains leading to profuse breeding of mosquitoes. Entomological collections made during the period showed that the mosquitoes were breeding profusely in rain water pools and paddy fields and resting in forest undergrowths. The main type of man-biting mosquito found was that of *Culex tritaeniorhynchus*. The study of animal fauna showed that the density of pigs, which are recognised reservoirs of JE in other parts of the world, was very low. It appears that pigs could have only served as sentinels in this situation.

Biological control of mosquitoes:

Concern on the environmental pollution due to large scale use of insecticides and the increasing resistance of mosquitoes to these has stimulated renewed interest in the use of biological agents for mosquito control. A survey carried out by the VCRC in and around Pondicherry showed the presence of mermithid nematode infecting mosquito larvae found in paddy fields. The nematode (*Reesimermis* sp.) was found in *An. vagus*, *An. subpictus* and *C. vishnui*. Susceptibility studies in the laboratory showed that *An. stephensi*, *C. fatigans* and *Ae. aegypti*, the vectors of medical importance, are also highly susceptible. In fields whenever parasitism occurs it was generally very high, the infection level sometimes

attaining 90 per cent. This results in the total extermination of the infected population of larvae. Studies show that the infective stage (preparasite nemas) can tolerate pollution and preliminary trials indicate that following application of the parasitic nemas to breeding places of *C. fatigans* the larvae become parasitised. Procedures have been standardised by the VCRC for mass production of the parasitic stages in millions.

These studies indicate that the nematode is a prime candidate which could be used alone or in combination with other agents (biological or insecticidal) in any integrated control method. The fact that this parasite is indigenous is an added advantage as nothing new would be introduced into the ecosystem in a release programme. Further, initial experiments indicate that infective stages of *Reesimermis* cannot become established in non-target organisms.

High risk G-6-PD deficient

The Blood Group Reference Centre, Bombay, has identified the high risk G-6-PD deficient populations in India. Thus, in Western India, the highest incidence of G-6-PD deficiency was seen in the Warlis (19.6%) followed by the Parsis (15.7 per cent), Bhanushalis (13.8 per cent), Gonds (11 per cent), Mahars of Aurangabad (10 per cent), Kokanas (8.2 per cent) and Dhodias (6.4 per cent). In northern India, the Khatris had the highest incidence (14 per cent) followed by that of the local population of Allahabad (11.1 per cent). The incidence among Punjabis was 7.1 per cent. In southern India the highest incidence (13 per cent) was among the tribals of Thailavarm in Andhra Pradesh, while the local population of Madras showed 9 per cent G-6-PD deficient.

Radioimmuno-assay kit for HPL:

The Institute for Research in Reproduction, Bombay, has developed a radioimmuno-assay kit for the estimation of human placental lactogen (HPL). This is an important hormone produced during pregnancy which can be used to evaluate the fetoplacental function.

ICMR NEWS

A meeting was held at the ICMR, New Delhi, on October 23, 1976 to discuss and formulate role of the ICMR and the line of action for the 'Integrated Rural Development Programme'. It was suggested that an inventory of resources and data on the incidence/prevalence of various diseases be collected, on the basis of which a malady remedy analysis table could be prepared. It was also suggested that a self employed cadre of local health care workers be created for delivering curative, preventive and promotive health services in the villages; training of these workers to be provided by Mobile Training Teams.

Dr. C. Gopalan, inaugurated the Journalists Workshop on 'Nutrition Communication' organised by the National Institute of Nutrition, Hyderabad in collaboration with UNICEF, on 8th November, 1976.

Dr. C. Gopalan, participated in the 42nd Annual Meeting of the Indian Academy of Sciences at Baroda, between 12th and 14th November, 1976, where he delivered a lecture on 'New Horizons in Nutrition Research'.

Dr. G.V. Satyavati, Chief, Division of Publication and Information, ICMR, participated in a training course on Scientific Editing sponsored jointly by the UNESCO and the Publication and Information Directorate (PID) at New Delhi between 8th and 16th November, 1976. She also participated in a seminar on 'Science publishing in India - problems and prospects' on 18th and 19th November, 1976 at the PID, New Delhi.

The Scientific Advisory Committee of the Central Jalma Institute for Leprosy met at Agra on 20th November, 1976.

Prof. Sydney Cohen, Professor of Chemical

Pathology, Guy's Hospital, London, visited various centres in India where research on the immunological aspects of Malaria is being conducted under the aegis of the Council, in November, 1976.

Dr. Usha K. Luthra, Deputy Director-General, ICMR, has been elected President of the Indian Academy of Cytologists for the year 1977.

Dr. B. Belavady, Deputy Director, National Institute of Nutrition, Hyderabad, participated in the meeting of the WHO Task Force on Breast Feeding held at Geneva between 1st and 5th November, 1976.

Dr. U.M. Joshi, Senior Research Officer, Institute for Research in Reproduction, Bombay, attended a meeting on 'WHO Programme for the Quality Control of Radioimmunoassay of Hormones in Reproductive Physiology' held at Geneva on the 18th and 19th November, 1976.

Dr. S.G. Srikantia, Director, National Institute of Nutrition, Hyderabad, participated in the WHO sponsored meeting of the Directors of Training Programmes in Public Health Nutrition, held at Geneva from 22nd to 26th November, 1976.

Dr. C. Gopalan attended the Annual Meeting of the Nutrition Society of Sri Lanka between 25th and 27th November, 1976, at which he delivered the Key note address. He also participated in the seminar on 'Identification of Priority Groups and Programmes'.

Shri S.K. Bhattacharya, Research Officer, National Institute of Occupational Health, Ahmedabad, proceeded on a one year WHO fellowship to U.K., to work in the field of Occupational Hygiene.

ICMR AIDED SYMPOSIA/SEMINARS/WORKSHOPS

A workshop was organised on the 'Role of Paediatricians in the delivery of health care' at Srinagar between 1st and 4th October, 1976.

An International Symposium on 'Molecular Basis of Host Virus Interaction' organised by the Institute of Medical Sciences, Banaras Hindu University, Varanasi, was held between 17th and 20th October, 1976.

A workshop and teaching seminar on 'Radioisotopes, Instrumentation and Techniques in practice of Nuclear Medicine' is being organised as part of the 8th Annual Conference of the Society of Nuclear Medicine (India) at Bangalore on 6th November, 1976.

A satellite symposium of the 9th International Diabetes Congress on 'Nutrition and Diabetes' is being organised by the Diabetes

Association of India at the Osmania Medical College, Hyderabad, November 8th and 9th, 1976.

A symposium on 'Development in Malaria Immunology' is being organised by the Indian College of Allergy and Applied Immunology, at the V.P. Chest Institute, New Delhi, on 8th November, 1976.

As part of the 45th annual meeting of the Society of Biological Chemists (India), Symposia are being organised on Reproductive Biology and Aging, Stress and Metabolic Disorders between November 12th and 14th, 1976, at the National Institute of Nutrition, Hyderabad.

The second National Symposium on 'Cryogenics' is being organised by the Indian Institute of Technology, Madras from 8th to 10th December, 1976.

An International Symposium on 'Vitamin and Carrier Functions of Polyprenoids' is being organised at the Indian Institute of Science, Bangalore between 8th and 11th December, 1976.

A Symposium on 'Prophylactic measures to combat deficiencies of fat soluble vitamins', is being organised at the Indian Institute of Science, Bangalore, on 10th and 11th December, 1976.

The Sixth All India Symposium on 'Bio-medical Engineering' is being organised at the Indian Institute of Science, Bangalore, between 14th and 16th December, 1976.

The Fourth Seminar on 'Data base of Indian Economy with special reference to

Health and Education' is being organised by the Indian Association for Study of Population at the Institute of Social and Economic Change, Bangalore on 22nd December, 1976.

A workshop on 'Research Methodology in Pharmacology' is being organised during the 9th Annual Conference of the Indian Pharmacological Society at the Institute of Medical Sciences, Varanasi between 26th and 28th December, 1976.

A Symposium on 'Physiology and Physical Performance' is being held during the 22nd Annual Conference of Physiologists and Pharmacologists of India, at the S.N. Medical College, Agra between 27th and 29th December, 1976.

A Symposium on 'Research and Treatment in Burns' is being organised during the 36th Annual Conference of the Association of Surgeons of India, at New Delhi, from the 27th to 31st December, 1976.

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

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

An International Symposium on 'Venom and Toxins' is being organised by the Haffkine Institute, Bombay in February, 1977

COUNCIL'S TRAINING PROGRAMMES FOR 1976-77

(A) EXISTING ANNUAL TRAINING COURSES:

Nutrition and Endocrinology:

At the National Institute of Nutrition, Hyderabad.

- (1) Annual Certificate Course in Nutrition; (December 1, 1976 to February 28, 1977)

- (2) Ninth M.Sc. (Applied Nutrition) Course: (June 1, 1976 to February 28, 1977)

- (3) *Fourth Annual Certificate Course in Human Nutrition for Teachers in Agricultural Universities.

- (4) Fifth Annual Training Course in Endocrinological Techniques and their application: (August 19 to September 30 1976)

Reproductive Biology and Fertility Control:

At the Institute for Research in Reproduction, Bombay.

- (1) Annual Training Course in Reproductive Endocrinology: (September 15, 1976 to October 15, 1976)
- (2) Seventh Annual Training Course in Reproductive Biology and Fertility Control: (November 1, 1976 to February 28, 1977)
- (3) Sixth Annual Training Course on Hormone Assays: (February 1, 1977 to March 31, 1977)

Haematology:

At the Blood Group Reference Centre, Bombay.

Training Course in Blood Banking and Basic Haematology for Technicians (February 16, 1976 to May 15, 1976)

Amoebiasis:

At the School of Tropical Medicine, Calcutta.

Technicians Training Course on Amoebiasis: (April 1, 1976 to June 30, 1976)

Biostatistics:

At the National Institute of Nutrition, Hyderabad.

Third Annual Training Course in Biostatistics for Statisticians and Medical Research Workers: (September 1976)

Animal Technicians Training:

At the Laboratory Animal Information Service, National Institute of Nutrition, Hyderabad.

Ninth Annual Animal Technicians Training Course: (September 1, 1976 to November 30, 1976)

Virology:

At the Virus Research Centre, Poona.

Diploma Course in Virology of Poona University (July 1, 1976)

Clinical Pharmacology:

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

A Training Course in Clinical Pharmacology and Drug Evaluation: (January 15, 1977 to February 28, 1977).

(B) NEW TRAINING COURSES DURING 1976-77:

Reproductive Biology and Fertility Control:

At the Institute for Research in Reproduction, Bombay.

Course in Cytology and Cytogenetics: (September, 1976)

Occupational Health:

At the National Institute of Occupational Health, Ahmedabad.

- (1) ICMR/WHO Training Course of Evaluation and Control of Industrial Environment: (February 16-28, 1976)
- (2) *Training Course on the organization of Occupational Health Programmes in Industry:
- (3) Training Course on Industrial Hygiene to be organised in collaboration with the National Safety Council: (November, 1976)

Haematology:

At the Blood Group Reference Centre, Bombay.

A certificate course in Blood Banking Technology and basic Haematology for medical Officers for a period of eight weeks (February 1, 1977 to March 31, 1977).

Laboratory Animal Technology:

At the Virus Research Centre, Poona.

A short-term course in breeding and maintenance of laboratory mouse colonies: (March 1977).

Leprosy:

At the Central Jalma Institute for Leprosy, Agra.

Medical Officers Training Course in Leprosy for a period of 6 weeks, commencing on 6th December, 1976.

(C) COURSES FOR TALENT SEARCH SCHEME FELLOWS:

Clinical Chemistry and Instrumentation:

At the National Institute of Nutrition, Hyderabad (March 1-10, 1976)

Cell-Biology and Cyto-Genetics:

At the Indian Institute of Science, Bangalore: (April 12-21, 1976)

Principles and Methods in Medical Statistics:

At the Tuberculosis Chemotherapy Centre, Madras: (December, 1976)

Immunological Techniques:

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

*Dates to be announced later

SCIENTIFIC LECTURES TO BE HELD AT
INDIAN COUNCIL OF MEDICAL RESEARCH HEADQUARTERS OFFICE
DURING NOVEMBER AND DECEMBER, 1976.

Date	Topic	Speaker
3.11.1976	Etiology of Chronic Cor Pulmonale in Delhi. (Dr. Kamala Menon Medical Research Oration, 1975)	Dr. S. Padmavati, New Delhi.
19.11.1976	Depressive illness in India. (Dr. P.N. Raju Oration, 1975)	Dr. A. Venkoba Rao, Madurai.
17.12.1976	Recent advances in Leprosy (Dr. Y.S. Narayana Rao Oration, 1975)	Dr. Dharmendra, New Delhi.
31.12.1976	Some facets of Human Muscular Dystrophy.	Dr. Anil Desai, Bombay.

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INDIAN COUNCIL OF MEDICAL RESEARCH
TALENT SEARCH SCHEME

Applications are invited from medical graduates, who have either completed or will complete their internship by the end of 1977, for Talent Search Scheme Fellowships. The candidates should be under 25 years of age on July 1, 1977, have secured a minimum of 60 per cent in the aggregate marks of the final MBBS and have passed all MBBS examinations in the first attempt. Candidates will be selected on the basis of an All India Competitive Examination. Selected candidates will commence their fellowship once they have obtained admission to a first-year residency recognised for the MD degree, in the institution of their choice. The fellowship is tenable for 3 years and carries a stipend equivalent to that of Government resident doctors.

The fellows who complete the fellowship successfully will be offered suitable positions in the Institutes under the Council. Full details and application forms are obtainable from the Director-General, Indian Council of Medical Research (TSS), Ansari Nagar, P. O. Box No. 4508, New Delhi-110016. Last date for receipt of completed applications is March 15, 1977.

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