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SYMPOSIUM REPORT

Symposium on emerging needs in leprosy research in the post elimination era: The Leprosy Mission Trust India

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Session I – Inaugural Session

Dr. Sunil Anand, Executive Director, The Leprosy Mission Trust India, New Delhi, India gave a brief description about the theme and objectives of the symposium in his welcome address.

Background

After the declaration of Elimination of leprosy in 2005, attention to leprosy has gradually diminished. In the last 10 years the leprosy scenario has not shown the improvement that was expected in the post elimination era - the number of new cases each year show no significant decline, and the complications of leprosy continue to cause disability and deformity which leads thousands to dehabilitation and untold suffering.

With the shrinking of available funds, research into leprosy has been neglected and now remaining only in a few organizations where fundamental studies on the disease are being carried out. To improve the situation, several strategies have been adopted by leprosy groups in enhancing research, capacity building on topics which are of priority to Government of India (GOI), WHO and ILEP, hoping that this would generate evidence based knowledge and learning to accelerate the eradication of the causes and consequences of leprosy.

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Aim of Symposium

This symposium was held by The Leprosy Mission Trust India (TLMTI) to highlight the present situation, identify the gaps in knowledge, inform the participants of the most recent developments in leprosy research and emphasize the urgent need to find solutions to the issues of leprosy.

Objectives of the Symposium

- To highlight the recent developments in leprosy research and emphasize lacunae in understanding on various aspects of leprosy.
- To provide an opportunity to share experiences and findings in leprosy research, disseminate and promote meaningful collaborations to accelerate progress towards finding solutions.

The Inaugural address was delivered by Dr. Anil Kumar, Deputy Director General (Leprosy), Ministry of Health & family Welfare on *"Leprosy in India: the present situation - why we need research"*

Dr. Anil Kumar presented an overview on the government policies for leprosy, 12th plan objectives for leprosy and leprosy programme strategies chalked out by GOI.

He mentioned that as there has been no change in the ANCDR and PR from 2005 to 2015 which clearly indicates that transmission of leprosy is still continuing. Dr. Anil Kumar highlighted recent initiatives that have been taken by the National leprosy Eradication Programme (NLEP) to control and/or diagnose leprosy by implementing leprosy case detection campaigns (LCDC), web based reporting system (Nikusth), developing new programme indicators, GIS mapping analysis of data by publication of NLEP newsletter, establishing a directory of experts, development of IEC strategies and social changes of leprosy colonies by bringing the population in to the mainstream of community. He discussed on the gap areas in leprosy research, such as mode of transmission, understanding the reasons for reactivation of past infection and/or new infection, need for development of a field test for early diagnosis, reasons for delay in reporting, role of chemo-prophylaxis and immune-prophylaxis in cure of leprosy, mechanisms involved in nerve damage and, socioeconomic and cultural factors responsible for acceptance of cured leprosy cases.

Dr. Anil Kumar suggested initiation of research in these areas including KAP (Knowledge, Attitude and Practice) studies. Further, he mentioned that we should find out ways to improve quality of life of leprosy patients and rehabilitation of patients in society. He also suggested that there is a need for work to be done in collaboration between all stakeholders and other organizations engaged in leprosy work.

The Key note address was delivered by Dr. V.M. Katoch, former Secretary, Department of Health Research, Govt. of India and former Director General, Indian Council of Medical Research, New Delhi on *"Unsolved problems in leprosy"*

Dr. V.M. Katoch described the history as well as the present scenario of leprosy and lacunae in leprosy knowledge.

He mentioned that in spite of having considerable knowledge about biology, immunopathology and molecular biology of *M. leprae,* there are still many unanswered

questions, such as: mechanism of nerve damage, persistence of bacteria in host and mechanism of transmission. Further, he mentioned that despite the declaration of elimination of leprosy with the help of MDT, progress of leprosy elimination has been very slow and its stagnation has been evidenced during the last 10 years. Pockets of endemicity are still present in several parts of the country. He expressed his concern over the alarming rise in deformities which indicates the existence of a big gap between people and its services. Persistence of high child rates shows continued transmission of disease. He mentioned that it is obvious that post 2005, the elimination strategy is not working in the current situation. He discussed that while accelerating the case detection and treatment, activities by active surveys will help temporarily, we need to develop micro-planning for different areas as the reasons for these problems are likely to vary in different settings in health systems, according to local ground realities. Such micro-planning will be effective if it is based on information generated by research in that direction and not by common sense alone. He also suggested that research cum action projects also need to focus on implementation of additional measures like chemoprophylaxis, immunoprophylaxis (*M. indicus pranii*/ BCG) or both as well as on modified regimens like UMDT with addition of immunotherapy as adjunct tools. He suggested that currently we have good molecular tools to trace the transmission and also to keep a watch on drug resistance situation. However, application of these tools has been limited and research studies on these aspects should remain a priority. He shared that research efforts need to be accelerated to achieve objectivity for reducing child transmission in a progressive manner and should target zero deformity which remains a main goal. He mentioned that while achieving good information from research on *M. leprae,* presence of another subtype, *M. lepromatosis* has to be kept in mind though this is not a top priority at the moment. In short, we need to understand the reasons for stagnation in elimination of leprosy in our journey towards eradication of leprosy from the world and at the same time keeping our focus on understanding the pathobiology of the disease.

Session II – Transmission of leprosy – What is new & what does it mean?

"Is the Environment playing a role in transmission of leprosy?"—Dr. U Sengupta

Dr. U. Sengupta delivered a talk on the role of the environment in the transmission of leprosy.

He mentioned that environmental *M. leprae* adapted to human from ancient times. He presented literature supporting the existence of leprosy from 2000BC old skeletal samples. He said, on the basis of published literature on follow up studies, in an endemic population a significantly large number of leprosy patients evolve from among those who are not household contacts of leprosy patients. He also mentioned that ANCDR/PR ratio has remained constant for many years, indicating active transmission of the disease in spite of MDT. Using molecular tools the existence of viable *M. leprae* in the environmental soil and water samples of endemic villages has been shown. Further, the genes associated with cell wall function, lipid synthesis, regulatory protein function, metabolism and virulence of these viable *M. leprae* were found to be up-regulated compared to *M. leprae* from host origin. He also mentioned that transmission of leprosy in contacts is occurring with the same genotype of *M. leprae* which is present in the patient and environment. The presence of both *M. leprae* and *Entamoeba castellani* have been demonstrated in both soil and water samples by PCR. However, he mentioned that till one finds *M. leprae* inside *E. castellani* it cannot be proved that amoebae are supporting the survival of *M. leprae* in nature. In addition, it has been shown that nasal carriage of *M. leprae* in the population was maximum during the

monsoon season. All these findings strongly indicated that environmental *M. leprae* is capable of spreading infecting a human host.

Discussion

Dr. V. M. Katoch: Transcriptome study is a proper approach to find out the viability of bacilli. Besides Purulia, West Bengal has it been done in any other place?

Dr. U. Sengupta: Besides Purulia this has been done in Champa at Chattisgarh. If one is able to change the living condition and habits of people, the scenario of leprosy transmission can be changed. Therefore, health education will be very essential to halt transmission.

Dr. H. K. Prasad: Suggested to perform nasal swab examination during monsoon as well as in water samples from ponds during same time.

Dr. Anil Kumar: Molecular evidence of epidemiology is definitely important for understanding the mechanism of transmission however, we need to do understand further the mode of entry of *M. leprae* to the host.

Dr. Jerry Joshua: What is the mode of entry of *M. leprae*?

Dr. U. Sengupta: Nasal epithelium is a vulnerable area for entry of *M. leprae* and I think this may be the route of entry. Experiments in mice have already shown that *M. leprae* can enter through nasal epithelium. Even study in human indicated that early lesions appear in the nasal epithelium.

Dr. Indira Nath: Amoeba infected with *M. leprae* has also been shown by a scientist in Japan.

Dr. U. Sengupta: A study conducted in USA has shown *M. leprae* remain alive up to cystic form of *Entameoba* after artificially infected with *M. leprae* under laboratory condition. We are designing experiments to isolate *Entamoeba* from soil and water of the endemic area and see whether the isolated *Entamoeba* contain viable *M. leprae*.

Dr. Kiran Katoch: Washings of patients' hand contained *M. leprae*. Further, she mentioned that in one survey they tested water from bore well (50–60 feet deep) and also water from pond for the presence of *M. leprae*. It was noted that while pond water was positive for *M. leprae* the water from bore well did not show the presence of the organism. We also tested soil from environmental area (where people share their eatables and exchange dialogues) and the sample was also found to be positive for *M. leprae* by PCR. So, environment might play a role in transmission and people can be infected with *M. leprae.*

"Leprosy Vaccine – Hope and despair" –Dr. Indira Nath

Dr. Indira Nath discussed the basic unresolved issues regarding development of a leprosy vaccine, history of vaccine trials and future vaccines.

She discussed issues which are still unresolved in vaccine development. It is well documented that protection to intra-cellular bacteria needs a well developed T cell mediated immunity. However, still antigens for protective immunity vs. effector functions and correlates of protection are not known for monitoring effectiveness of leprosy vaccines. Further, she mentioned that we need vaccines for a sustained protection because vaccines provide memory but drugs do not. Dr. Indira Nath described previously used vaccines and

their clinical trials like BCG, BCG + heat killed *M. leprae*, *M. w* [*M. indicus pranii* (MIP)], ICRC (Indian Cancer Research Centre) strain, *M. vaccae*, *M. vaccae* + BCG and *M. habana*. She mentioned further about future development of vaccines like a subunit vaccine developed by IDRI (Infectious Disease Research Institute) group. This subunit vaccine is a group of fusion proteins of antigens that are recognized by paucibacillary (PB) patients and produce IFN-γ. This vaccine may come under clinical trials.

Discussion

Dr. U. Sengupta: IDRI group are waiting for FDA approval. Further, this vaccine has been tested in armadillo, wherein the vaccine was able to prevent nerve damage. Further, if the vaccine trial is initiated the vaccinated population should be followed up for more than 5 yrs to find out the correlates of protection.

Dr. V.M. Katoch: ICRC is also a good candidate vaccine. However, vaccine is a good immune modulator and is effective against both leprosy and tuberculosis. However, population selection is a crucial step for testing the effectiveness of a vaccine. Further, duration of protection and episodes of reaction have to be monitored in the vaccinated population.

Dr. Kiran Katoch: MIP is an excellent Immunotherapeutic agent. If the vaccine is administered during treatment, occurrence of reactions is very rare. No precipitation of nerve damage has been noted. There is no need for administration of steroids. Reactions can be treated with the help of aspirin only. Mild ENL reactions can be treated with low dose of steroid. Further, there will be fewer occurrences of deformities. Now *M. indicus pranii* is available with Cadilla as Leprovac.

"Present leprosy Scenario in India – what is the need of the hour?"—Dr. K. Katoch

Dr. Kiran Katoch's presentation was about the epidemiological issues of leprosy in India, the factors affecting the epidemiology and deformities observed in the emerging leprosy cases.

She mentioned that following house to house survey using inverse sampling methodology, the ANCDR was higher than the presently available NLEP figure. Further, she mentioned that the deformity rates reported in the present survey was about 2 per 100,000 populations but the number of leprosy cases reporting with deformities was actually much higher than this. She expressed her concern about increasing proportion of child cases in various clusters and stressed the need for immediate attention to this problem. She framed a set of research priorities for leprosy as follows: to develop laboratory tools for early diagnosis of leprosy, to work on identification of predictors for reactions, to develop better tools for diagnosis and treatment of reactions, to improve the understanding on transmission dynamics, to monitor and evaluate failures and altered responses, to train and re-orient workers with latest technologies and developments, to monitor drug resistance and surveillance. She stressed the need for inclusion of training programmes in leprosy for all General Health Services functionaries and involvement of Accredited Social Health Activist (ASHA), Urban Social Health Activist (USHA) and other health workers in leprosy. She said that IEC activities should be intensified with participation of Panchayati Raj members and treated patients. She mentioned that emphasis should be put on prevention of disabilities, treatment of reactions, medical rehabilitation and dialogue between different Government departments and ministries to obtain optimum benefits to the patient. She reiterated that monitoring and supervision of drug resistance surveillance should be one of the priorities.

Discussion

Dr. Seema Bacquer: A recent National survey done on stigma (100 patients were included) showed that people were discriminated even among relatives. Self stigma (by patient himself/herself) and Stigma by other people was also noticed.

Dr. Indira Nath: Suggested that we can analyze the epidemiological data by involving interns. It will benefit both the students as well as our system.

Session III (New Insights in Drug Resistance in Leprosy and its implications)

"Is emerging Drug Resistance In leprosy a Real Danger? - A Clinician's Perspective" –Dr. Sunil Dogra

Dr. Sunil Dogra presented his experiences on the clinical aspects of drug resistance.

He mentioned that fortunately Multi-drug resistance is only being reported in leprosy in a few case reports. But we have to be adequately prepared to face the future challenges with second line regimens in place with existing available anti-leprosy drugs or newer regimens for the future. He explained the urgent need for more potent bactericidal drugs for treatment of resistant cases. Further, he mentioned that good immunomodulators could be helpful in the treatment of leprosy and its complications. Finally, he raised an important question: Is it appropriate to advocate UMDT at this juncture? He gave some points to remember before advocating UMDT: In MB cases UMDT might increase the risk of relapse or resistance; what will be the outcome in highly bacillated MB cases? What is the compelling evidence and reason for introduction of UMDT? What benefit are we going to achieve with its introduction?

"Are we ready with alternative regimens?"—Dr. Vishal Gupta

Dr. Vishal Gupta described that of late, there has been an increasing interest in alternative regimens for leprosy and this might be due to the fact that though we are seeing lesser numbers of leprosy cases, the proportion of MB cases has been gradually increasing even in this post-elimination era. This would suggest that something other than the standard MDT may be required for this subset of patients. He mentioned that since the standard MDT has only 1 bactericidal drug, Rifampicin; the alternative regimens have focused on incorporating the newer bactericidal agents like Rifapentine, Moxifloxacin, Sparfloxacin, Ofloxacin, Minocycline, Clarithromycin, etc. He discussed some newer regimens and their shortcomings in clinical trials like ROM-based regimens, Accompanied-MDT, Uniform-MDT, MDT-2000, RO regimen, Quadruple regimen, Rifampicin, sparfloxacin, clarithromycin, minocycline, PMMx regimen. In conclusion, he mentioned that alternative regimens might prove superior however, these have not been tried yet.

"Drug resistance to WHO recommended MDT in leprosy" –Dr. Mallika Lavania

Dr. Mallika described the occurrence of drug resistance in relapse cases of leprosy.

The Stanley Browne laboratory, where the work is done is one of the centres for sentinel surveillance of drug resistance of WHO. All 14 TLMTI hospitals are included in this surveillance. In addition to look for occurrence of secondary resistance, primary resistance is also looked for in new cases who are not responding to MDT. She mentioned that rifampicin resistance (mutation) was identified for the first time in TLM Hospitals in India. Seventy

per cent of new cases in these hospitals are MB leprosy. All MB patients are given WHO recommended MDT. The Number of relapse cases is increasing every year. West Bengal, Chattisgarh and Maharashtra reported the maximum number of relapse cases, evident from both Government and TLM records. She cited the WHO criteria for classifying a relapse case. The objective of this study is to detect drug resistance in relapse cases. Since 2009, 225 samples have been received, out of which 164 could be amplified. 22 secondary rifampicin resistant cases were recorded. Resistance to rifampicin, dapsone and ofloxacin was noted in relapse cases. Five cases of primary resistance to rifampicin have also been noted in Champa. All these indicate that field interventions are required with more extensive coverage of surveillance program especially in the leprosy endemic pockets. Dr. Mallika pointed out that rise in number of the cases with resistance to rifampicin indicates that resistant strains are actively circulating in some endemic pockets of India, suggesting an urgent need for development of drug-resistance monitoring policy and meticulous post-treatment follow-up of cured patients in order to detect relapse earlier and rapidly identify resistant strains. This further indicates an urgent need for identification and inclusion of new drugs in the regimen for treating such cases.

Discussion

Dr. V.M. Katoch: There is a need for alternate regimen/immunotherapy in addition to chemotherapy. DNA sequencing is a good idea for initial screening. Any **n**ovel mutation should be confirmed by mouse footpad (MFP) studies. In the case of resistance, if the mutation persists at some codon region which has not been reported earlier it should be confirmed by MFP growth; otherwise it may result in loss of some important information. Hence, the approach should be to preserve the DNA for future technique development to look for codon changes beyond the DRDR region.

Dr. H.K. Kar: How many samples of relapsed cases did you receive and how many of them were resistant to rifampicin?

Dr. Mallika Lavania: Out of 164 relapsed cases 22 were resistant.

Dr. H. K. Kar: That indicates that in majority of relapse is mainly due to incomplete treatment or any other reason and not due to drug resistance.

Dr. Joydeepa Darlong: In TLM hospitals we only diagnose a patient as a relapse case if we are sure that he/she has been compliant, and relapse is categorized according to WHO criteria. We are sending samples only from these cases. Patients showing non compliance or having no past records are not considered as relapse.

Dr. H. K. Kar: Then it would mean that duration of treatment for one year is not adequate.

Dr. Archna Singhal: During the last 2 decades the disease pattern in our OPD has changed. Last year we registered 75 cases and out of these 73 are MB and only 2 are PB. Out of these 73 cases more than 80% cases were having more than 4+ BI. One year of MDT in these cases are not highly insufficient. Many of these cases are coming with de novo reaction. Previously we could treat them adequately and could release them as RFT. Nowadays we are unable to make them RFT because of shortage of medicine. Reactions which could be controlled by thalidomide is not available and even the anti-inflammatory drugs, extra clofazimine required

by reaction-patients are not supplied by the GOI. Therefore, we will have to fall back on steroid and it becomes very difficult to take off such reactional patients from steroid.

Dr. V. K. Pai: While talking about high BI cases, we at our hospital used to assess the Morphological Index (MI) at RFT and noted that many such cases were still having high Bacteriological Index (BI) with MI to the tune of 6·3%. My point is that, how the relapsed cases who showed resistance were dealt with? Were the patients put on another course of MDT or a different regimen?

Dr. Joydeepa Darlong: In such cases we administered another course of WHO recommended MB MDT for 1 year, and the cases relapsed again. However, we got a good response with 24 moths of ROM therapy. Apart from this we have not treated our patients with any other regimen.

Dr. H. K. Kar: If one finds high BI even after one year of MDT one can continue with another year of MDT. This is already mentioned in the treatment guidelines.

Dr. V. V. Pai: I would recall the multi-centric trial which was conducted by 7 centres in India. We sent samples from incompletely and arbitrarily treated cases for resistant studies – what has been the result of that study?

Dr. V. M. Katoch: That multi-centric study showed only 2 dapsone resistant cases and 1 rifampicin resistant case at molecular level but not supported by MFP growth. After starting MDT and after the running of the intensive programme for 25 years, the resistance to dapsone which posed a problem in the past disappeared due to introduction of MDT. Now, it seems something is happening and from the report of TLM and other Institutions it seems that resistance is probably appearing again. It is true that now patients are reporting late and that is why we are finding more advanced stages of the disease. Because the finding of high BI cases, the smear examination should be started again with estimation of MI and along with FDA-EB staining which can be easily done in Institutions under fluorescent microscope.

Dr. V. V. Pai: It is clear that in some relapse may be due to resistant bacilli. But in most of the cases it may be due to persisters because the patients respond to re-treatment.

Dr.H. K. Kar: Relapse may be due to persisters, however, as these lepromatous cases lack in developing cell mediated immunity against *M. leprae* they may get re-infected. Many of these relapse MB cases are coming to the Dermatologists and it is expected that ICMR/Govt. of India will build up a network for screening resistant strains so that samples could be sent to the Identified Centres or TLM.

Session IV – Research and management of lepra reaction and social aspects of leprosy

"Recent Developments in our knowledge of lepra reactions & lacunae" –Dr. VP Shetty

Dr. VP Shetty described leprosy reactions type1 (reversal) and type2 (ENL), their complications and predictors of reactions.

Type1 reactions can occur before in about 30% of patients and during MDT in about 20% of patients and even after stopping MDT in about 5% of patients. Type 1 reactions generally occur in borderline patients. Patients having a previous episode and high BI are prone to get

repeated episodes of reaction and it may occur in 10% of cases. Risk factors for type 1 reactions are BT to BL, females, pregnancy and post partum periods, large facial lesions, multiplicity of lesions, older age group, large tender nerves, co-existence of HIV and leprosy on anti-retroviral treatment. Type 2 reactions generally occur in BL/LL cases and mimic immune complex mediated conditions. Pain is expressed in 96% of patients and is severe in nature. Incidence is about 50% in LL cases and 7% in BL cases. Some variants of ENL manifestation like Lucio phenomenon and Lazarine leprosy have been recorded in Mexican populations. Risk factors are BI more than 4+, age more than 40 years, intercurrent infection with streptococcus, virus and malaria, etc. Trauma, stress, immunization and pregnancy also can precipitate ENL Reaction. Immunologically, in type1 there is a shift to Th1 response and there is increase in the levels of proinflammatory cytokines like IFNγ, IL-12 and NO in the lesion. In type 2 reaction the immunecomplex gets deposited in skin lesions, rise in Th2 and cell mediated immunity (Type IV) may also be noted as well as increase in levels of IL-4, IL-5, IL-10 and IL-13 have been noted. High levels of TNF was noted which could be reduced by administration pentoxifylin and thalidomide. Polymorphisms of NOD2, IL-6 and NRAMP1 have been associated with type 2 reaction. Predictors of reaction and with nerve function impairment have been studied. A large multi-centric study (INFER- cohort study) could not find any biomarker or antibody levels which was associated with reactions, except the level of IP10 in type 1 reaction. Metabolically active *M. leprae* might play an important role in T1R. Presence of antigen 85 and HSP 65 in localized lesions, over expression of metabolic gene (accA3), higher cDNA copy numbers of TlyA gene in T1R lesions in comparison to non-reactional lesions have been noted. High levels of acid glycoprotein has been correlated with ENL. Stress must be put on the gaps in terms of translational approach (knowledge gained needs to be applied in the field). Prolonged use of corticosteroids needs to be covered with MDT, need to expand on the scope of developing a sensitive and specific biomaker for reaction prediction & susceptibility. Further, she mentioned that we should look beyond drugs, for preventive alternatives e.g. Vit. D insufficiency has been associated with number of infectious diseases and role of nutrition and hygiene. Major hurdles for research in leprosy are dying interest in the subject and financial crunch.

Dr. KiranKatoch: Immunotherapy along with chemotherapy is useful in reactions.

Dr. V.P. Shetty: Yes, I think it should be done. A small study has been done by us with the immunomodulator which has definitely helped in controlling reactions.

"Challenges in management of leprosy reactions" –Dr. H K Kar

The paper was presented in the form of few case studies. Dr. H.K. Kar described various features observed and diagnoses made on cases at different times, which ultimately highlighted that proper methodology to confirm the diagnosis is one of today's challenges.

The challenges today include methods to distinguish relapse from late reversal reactions, accurate diagnosis in patients with similar clinical profiles.

Facial lesions with reactions generally do not subside easily and persist for many years even after administration of steroids. The reason for this is not known. In exposed areas of the body does sunlight have any role to play? Further, there should be some laboratory tools to differentiate between Type1reaction and relapse. Another complication is crusting occurring on the lesions of nodular LL. Corticosteroid treatment should be given in the dose of 1 mg/kg body weight, till the reaction subsides and only then it should be tapered off gradually. Other immunosuppressive drug like methotrixate has also been useful for suppressing Type1

reaction when there is a problem with steroids. Other drugs are cyclosporine A and azothiaprine which have been also been useful. Local application of tacrolimus, an immunosuppressive drug which inhibits IL-2 production required for T cell proliferation, has been found to be useful for facial lesions in Type1 reaction. For first episode of Type II (ENL) reaction thalidomide is better than prednisolone. For recurrent ENL thalidomide and prednisolone combination is better than thalidomide-clofazimine combination. Dr. Pai and his group have shown that high dose prednisolone is better than low dose prednisolone in controlling ENL reaction. In addition betamethasone pulse therapy trial in chronic recurrent ENL has been found to be effective by Dr. Girdhar and his group at JALMA. Dexamethasone pulse therapy has been also found to be effective in chronic ENL reactions by Mahajan and group. Thalidomide derivatives are also useful in controlling ENL reaction. However, trials for these newer drugs have to be initiated. TNF inhibitors have been tried which are effective but these are not cost effective. Immunotherapy with MIP is very effective in controlling recurrent ENL. The presentation highlighted the importance of accurate diagnosis of leprosy and its reactions and their management with chemotherapy and immunotherapy.

"Research Needs and Challenges in Stigma reduction" -Dr. R K Mutatkar

Social stigma is a generic term which restricts its social role in optimum efficiency. Stigma is a social construct. In leprosy, historically social exclusion is an indicator of helplessness in our medical knowledge in all systems of medicine. People identify leprosy only by deformity which was considered communicable and dangerous to the society. In families, a leprosy affected person used to be discriminated against and quarantined in leprosy colonies, which later were dignified as leprosy hospitals. Even leprosy workers were discriminated against, including leprosy pathologists in laboratories as reported in Quantifiable Academic Sciences in the Vatican in 1984. Stigma became a public health problem when a treatment for leprosy was found with Dapsone and later with MDT. Finding of a patch as a sign of leprosy increased the fear of leprosy. However, reduction in stigma will only be possible by conducting IEC activities in the community and by involving the community in the anti leprosy campaigns and programme. With reference to NLEP programme in the post eradication era, a few aspects of public health planning, lacunae with health education, IEC, BCC programmes were highlighted. It is important to conduct studies on social and cultural epidemiology to address stigma as a public health problem. Larger multi-centric intervention studies are required to remove fear of leprosy by people-centric and not patient-centric activities, undertaken by paramedics/volunteers approved by Gram Sabha/PRI/CBOs.

"How do we diagnose leprosy early?"- Joydeepa Darlong

Dr. Darlong spoke on some novel methods which were tried to improve early case detection.

She mentioned about the stagnation in PR and rise in ANCDR and child cases of leprosy. Early diagnosis of leprosy is very important and delay in diagnosis is on an average between 6 to 18 months, which leads to many avoidable problems. Contacts and children are a vulnerable group. For villagers local quacks and village practitioners are the first point of contact for health care. Primary reasons for delay are inaccessible referral systems, lack of diagnostic tools and declining clinical expertise to diagnose leprosy amongst the professionals. Often because of the lack of clinical expertise in diagnosing leprosy patients are detected late. Ineffective referral system is another reason for delay. Patients, after being diagnosed, are referred to Government hospital and from there many of them are defaulting and no follow up of these defaulters are being made.

In the present study, effort has been made by describing a few innovative case detection methods with an intention to enhance the identification of early cases and effective control and prevention of permanent disability to the community representatives and stakeholders. The methods of case detection implemented include the following. Innovative school surveys were conducted where school children were trained regarding early symptoms of leprosy and then encouraged to examine each other. Another method was intensive education and motivation of the index case leading to house hold contact examination which yielded very good results. The third new method was orientation of local non formal private practitioners in signs and symptoms of leprosy, and encouraging them to refer suspects with suggestive signs. The latter two methods proved very effective when tried out in an endemic district in West Bengal.

The way forward: Panel Discussion

Dr. V M Katoch, Dr. Indira Nath, Dr. Kiran Katoch, Dr. R K Mutatkar, Dr. U Sengupta, Dr. Sunil Dogra, Dr. Sunil Anand

After extensive discussion the following recommendations were made:

Recommendations

1. Increase attention to training of young medical professionals so that they can diagnose leprosy and early nerve damage, and treat them.
2. Creating and maintaining leprosy expertise by Empowerment of PHC staff, health care workers and all medical care professionals for suspecting and bringing in early cases of leprosy for diagnosis.
3. Empowerment of the community in facilitating accessibility of treatment and reduction of stigma
4. Introduction of immunotherapy and immuno-prophylaxis (by Leprovac inoculation) in the NLEP; especially for MB cases.
5. Reintroduction of practice of slit skin smear in the PHCs and NLEP to facilitate identification of Relapse, resistance and MB cases with no visible patches (Infiltrative).
6. Patient should not be released from treatment until MI 'Zero' is attained.
7. NLEP should not accept UMDT for MB patients.
8. MB leprosy patients with high BI/Mi (>4) often do not respond adequately to 12 months MDT MB Regime. Long term follow up should be done for them.
9. Detect early reaction and nerve damage for high risk group of leprosy patients with the help of bio-marker like IP-10 and if any other biomarkers are found.
10. Leprosy cases with BI 4+ or more should be kept on longer follow up while on a drug trial.
11. Focused brainstorming sessions comprising of dermatologists, immunologists, bacteriologists and other experts to discuss and develop strategies to combat Drug resistance. GOI, WHO, ILEP and ICMR should lead this.
12. Development of Regional Referral Centres with active and efficient facilities for surveillance and treatment of Drug Resistance.
13. Initiative need to be taken for development of second line anti leprosy treatment.
14. Have inter-sectoral and inter-ministry plans and activities for improvement of services to leprosy patients.

15. Attention to Advocacy initiatives.
16. Empower people affected by leprosy suffering from reaction to tell doctors about the subtle symptoms of reaction.
17. Improve and increase IEC campaigns, developing them in a scientific manner with communication experts.
18. Create a system to identify high risk individuals for developing leprosy.