Dear Readers

2018 was a year that brought in a renewed focus to defeat leprosy. The Government of India prioritized elimination of leprosy and global program for zero leprosy was launched. The TLMTI 2016-2018 country strategy came to an end and a new one was formed. CS 2019-2025 identified research and training as a strategic objective, named the “Thought Leader”. TLMTI's research and resources strives to become a reference point, nationally and globally, for proactively influencing policies relating to leprosy, disability management and community empowerment in the coming years.

This issue has an article on “Relevance of leprosy research” by Dr Rupendra Jadhav who was founder head scientist of SBL in the 90’s. The case story asks some questions which need thoughtful answers. In our quest for breaking transmission, we are still yet to understand the role of environment. The published abstract gives a possible link to role of amoeba providing a protective niche for M.leprae.

We are pleased to announce that SBL has completed 25 years of research and service in the. To commemorate the occasion, SBL is conducting a symposium in May. The invite is enclose.

Happy reading!

Joydeepa Darlong

Relevance of leprosy research
in post elimination era

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Public health interventions for any infectious disease requires strategic planning that transits through stages like disease control, elimination of disease, elimination of infection, eradication of the disease and final extinction of the disease (1). The status of leprosy in India as well as globally needs to be assessed in this frame so that we will be able to actually understand where we are. For eradication of infectious diseases it is important to have prophylactic measures like availability of vaccine or one need to know the source of infection and the reservoir of the infectious agent so that using appropriate intervention strategies, the interruption of disease transmission can be achieved. Unfortunately, for leprosy neither we have effective vaccine that could be used for prophylaxis of population nor we are very sure of all possible sources of infection. It is desirable to have focus in these areas.

India declared elimination of leprosy at national level in 2005. In last 13-14 years the disease should have slowly gone down. As Mycobacterium leprae, causative agent of leprosy is an obligate pathogen and human being as the only likely natural host (at least in subcontinent), diagnosis and treatment of the new cases should have yielded the expected results. This assumption is based on the fact that only active leprosy cases are likely to act as reservoir for the pathogen and treating cases should probably suffice to bring down the bacterial load in the community and hence the transmission. As shown in figure 1 since after the sharp decline in new cases around 2004-2005 and 2005-2006 (when India declared elimination), the number of new cases detected have been fluctuating between 125000 to 135000 which contributes to almost 60% of the total global case load (2). These observations raise questions about reservoir of infectious agent.

Fig. 1: Number of new cases reported in India
As there is no regular active surveillance for case detection, the possibility of presence of unreported/hidden cases in the community can’t be ruled out. Furthermore, due to long incubation period and time lag between clinical manifestation of the disease and diagnosis can have impact on the disease transmission in the community. Many reports have suggested sub-clinical infection in normal healthy population in endemic areas (3-5). But it is still a challenge to discern difference between sub-clinical infection and transient carriage. Reports have also indicated possibility of extra-human reservoir for the pathogen (6-8). Though M. leprae is obligate pathogen, possibility of its survival in the environment where higher life forms like amoebae acting as protective niche can’t be ruled out (9-11). This can further complicate transmission of the disease. Role of climate in survival of M. leprae in the environment, personal & community hygiene, sanitation and exposure risks for the disease transmission are still areas that require more clarity. It is a known fact that in developed countries leprosy went down with economic development. One can assume that economic development was linked with better sanitation, improved hygiene, supply of treated and piped water, mechanisation of farming practices etc. Link of this with decreased disease transmission appears logical and needs further investigation. Hence, Indian Government’s initiative 'Swachh Bharat Mission' can have profound effect on infectious disease transmission. Operational research and data collection in this context will provide insights for planning health strategies.

As shown in figure 2, the number of child cases for last many years (post elimination) has been between 8-10%. This strongly suggests active transmission of the disease going on in the community. So assumptions that we may be just reporting backlog cases will be misleading. This emphasizes need of early diagnosis and proactive case finding.

Figure 2: Chid cases and cases with Grade II deformity (NLEP Data)

Though clinical picture of the disease with reference to visible deformities may have changed, but the Grade II deformity levels in patients for last decade have not changed much (figure 2). It is needless to say that the stigma associated with the disease is due to deformities and a lot more is desired to be done in this area. Nerve function impairment due to nerve damage during the course of the disease (immunological reactions) result in deformities and hence finding markers for early detection of nerve function impairment or patients as risk to develop reaction is essential.

As of now multi drug therapy has been highly effective and success of disease elimination can be attributed to it. But some isolated reports on drug resistance and recent more organised data on global surveillance on drug resistance in relapse cases has raised concerns (12). What appears as a secondary drug resistance in relapse cases may turn into primary drug resistance in new cases which will then severely impact the disease control programme. Hence, monitoring drug resistance and simultaneously developing new alternative drugs has become the need of the hour.

It may appear that we have covered a large ground and it is just a last mile to go to reach zero leprosy status. This can bring complacency which will be very dangerous at this stage when we actually require better diagnostic tools for early case detection, improved clinical management that will help in prevention of nerve function impairment and alternative medicines to tackle drug resistance and non-responding reaction cases. Leprosy status is hanging between stages of elimination disease and elimination of infection. This trend need to move forward towards eradication and not backward. Maintaining status quo will not help.

References:
1. https://www.cdc.gov/mmwr/preview/mmwrhtml/su48a7.htm


INNER WELL BEING
CORE TEAM MEETING

The inner wellbeing core resource team meeting was held at TLMTI conference hall in New Delhi for 2 days from 28th Feb – 1st March 2019. 7 TLMTI Staff attended out of which 2 were qualified counsellors and the rest lay counsellors. The aim of the workshop was twofold.

1. IWB activities in the hospital programme and its reporting
2. Research in IWB

The workshop started with an overview of the new country strategy and how inner well being activities are an integral part of the services provided. It was stressed that holistic care is possible only when physical and mental health is taken care of. This was followed by a discussion on experiences of counselling at their centers. The WHO 5 questionnaire was discussed in detail. It was decided that the translated questionnaires in different languages would be validated. The role of CRT would be to facilitate the Inner wellbeing activities in their neighboring TLM hospitals. An introduction to the mental health research proposal was done. PHQ 9 questionnaire was discussed and the participants practiced this on staff from country office. This gave them a better understanding of the questionnaire. The research methodology, sampling, sample collection etc. was discussed and a disease profile database was created in a participatory manner. The research study areas were finalized for each state participating in the study along with the method of selection. The workshop ended with Dr Mary Executive Director TLMTI, encouraging them and reinforcing the role of counselors in the holistic care of the mission.

Feedback

“We have gained a lot of clarity in using the WHO 5 wellbeing index, and excited to start the research. It has methodically taught us what to do in our centers and how to effectively report.”

Mitalee Benjamin, Counsellor, TLM Kothara

Ms Sadhana Singh conducting a IWB sensitization seminar for staff of TLM Naini

Hands on Practice of WHO index 5

CRT member Mr Ranjan Roy with counselors from Muzaffarpur, Kolkata and VTC Bankura
The 2nd International Conference on “Antimicrobial Resistance, Novel Drug Discovery and Development: Challenges and Opportunities” was organized by SRM University Delhi-NCR Sonipat in association with Royal Society of Tropical Medicine and Hygiene, UK in March 2019. TLMTI research staff presented 3 posters on resistance in leprosy.

1. Whole genome sequencing of Drug resistant M. leprae strains form India.
2. An analysis of drug resistance mutations in M leprae isolates in untreated and relapsed leprosy patients reported from SBL.
3. Case report: management of rifampicin resistant leprosy

Prof. Ada Yonath, Nobel laureate 2009, spoke on Ribosomes – a connection between the far past and near future. It was fascinating to hear from Francois Franceschi (Project Leader of GARDP), Dr. G.P Talwar (Padma Bhushan awardee), Dr. V.M Katoch (Chair of Public Health Research at RUHS, Jaipur) and Dr. Tom Blundell (Director of Research and Professor Emeritus in the Department of Biochemistry, University of Cambridge) among many others on various aspects of antimicrobial resistance and its management. It was a good learning experience.

Montu, a 33 year old patient with lepromatous leprosy and was admitted for control of ENLs and initiation of thalidomide therapy. He had been suffering from leprosy for 3 years and this was his 7th episode. He was dependent on steroids and currently on 40 gm of prednisolone without remission of symptoms. He had extensive ENLs, most of them were necrotic and in some areas, they had coalesced to form abscesses. He was brought by his wife’s younger brother who stayed in the hospital to take care of his activities of daily living. It took about 3 weeks of medication and supportive treatment to stop the eruption of ENL’s and 6 weeks for the necrotic ENL’s to start healing and was discharged after 4 months.

Montu was a mechanic in a garage, due to his illness he lost his job. They went to stay with the wife’s parents since his parents were dead and he had no siblings who would support him and family of 3 kids. They sold the land in the early part of the illness and that money was exhausted. The wife’s family took them in and the brother in law, a daily laborer himself was without any income while he was with Montu in the hospital. Due to extreme pain and reactions, he could not avail public transport. His children left school. This whole illness left him impoverished.

In 2018, TLMTI hospitals registered 5095 new untreated leprosy patients, of which 1515 (30%) were positive for leprosy and 810 (17%) had BI more than 4. It is known that those with high BI are prone to such reactions as Montu had. They are more likely to lose jobs and have catastrophe household expenses. How do we support such people? What issues can be advocated? What about their mental health? Let’s keep ourselves sensitive to needs such as these.
Survival of Mycobacterium leprae and association with Acanthamoeba from environmental samples in the inhabitant areas of active leprosy cases: A cross sectional study from endemic pockets of Purulia, West Bengal.

Turankar RP, Lavania M, Darlong J, Siva Sai KSR, Sengupta U, Jadhav RS.

Abstract

BACKGROUND:
Mycobacterium leprae being an obligate intracellular parasite cannot be cultured in any artificial culture media but it has been shown to reside in wild armadillos in North America. Many studies suggested that M. leprae could be found in the environment and may have a role in continuing transmission of the disease. The exact role of the environment in the transmission dynamics is still speculative. The present study was undertaken to find out the presence of viable M. leprae around patients’ environment like soil and water and association of free living pathogenic protozoa, Acanthamoeba which might play an important role in transmission of the disease.

METHODS:
Seven hundred soil and 400 water samples were collected from the surroundings of the houses of leprosy patients from endemic villages. Two hundred soil and 80 water samples were also collected from the surroundings of normal inhabitants from non-endemic villages as controls. These samples were screened for the presence of M. leprae and Acanthamoeba using DNA PCR. RNA was extracted from the PCR positive samples and Reverse Transcriptase - PCR targeting 16S rRNA gene region was performed for detection of viable M. leprae.

RESULTS:
We observed high PCR positivity in soil samples (218 out of 700; 31%) and water samples (73 out of 400; 18%). These samples when further screened for viability, it was observed that 106 soil samples (15% of total) and 34 water samples (8% of total) showed presence of 16S rRNA. We observed 18.3% of soil and 20.5% of water samples were PCR positive for Acanthamoeba. Soil samples from the control area, where no active leprosy case resided in the last 5 years, showed PCR positivity in 4 samples (2%) for M. leprae DNA in only soil samples with all water samples being negative. RT-PCR for all PCR positive soil samples was negative. Of the 106 soil samples positive for M. leprae RT-PCR, 30 samples were also positive for Acanthamoeba whereas out of 112 M. leprae RT-PCR negative but PCR positive samples only 10 samples were Acanthamoeba positive showing association of viability with presence of Acanthamoeba (p = .0021). Similarly, for water samples also, association of M. leprae viability with presence of Acanthamoeba was seen (p = .0009).

CONCLUSION:
This study suggests that the surrounding environment (soil and water) of leprosy patients contain viable M. leprae and the viability has association with Acanthamoeba which may provide a protective niche for M. leprae. This could play an important role in the focal transmission of the disease.