EDITORIAL

The year 2019 has come to an end and as I retrospect, my mind ponders over a myriad of thoughts. This year started with preparations for International leprosy congress. There were numerous entries of abstracts form TLMTI, out of which 64 were accepted. Kudos to all the researchers, small and big, basic science, clinical, social who contributed and made the organization proud. TLMTI's research history dates back to 1968… and the legacy is still going strong.

Another milestone achieved was the silver jubilee of the Stanley Browne lab that has pioneered many pathbreaking research findings impacting the management and understanding of leprosy. We salute those past and present lab scientists who have contributed to the science of leprosy.

Adding to the list of achievements, we were pleased to be the recipients of the first NIHR grant and will be working towards improving wound care in leprosy. This is such a pertinent topic and can be integrated with management of ulcers of any aetiology.

I had the privilege to visit some of our hospitals this year. People affected by leprosy with complications are still thronging and receiving care and healing. Reactions and Neuritis with multimorbidity and ulcer wards full of non-healing trophic ulcers are given wholistic care. I have written a brief series of cases in this newsletter that I saw in one day at the outpatient's department in Purulia. It's a shocking revelation and demands more expertise and resources.

Mental health and inner well-being have been researched in a special way at TLMTI and we will be soon publishing our findings. Depression and anxiety are prevalent in people suffering from leprosy. We propose interventions that will manage these co morbidities and enable well-being among sufferers.

It's December and we are once again reminded that Christmas is here. We celebrate the birth and life of Jesus who taught us to love those that the world hates, embrace those that are excluded and honour those that have lost their dignity. Let us seek wisdom from God and renew our resolutions in the coming new year 2020 to research better and smarter.

Wish you all a joyous Christmas and a Blessed New Year.

Joydeepa Darlong

CASE STUDY

Dr Ravindra P. Turankar

This case study was initiated in TLMTI, Kothara hospital, district Amravati and included all the aspects of leprosy including clinical, laboratory (molecular and social aspects of leprosy. In this intramural pilot project entitled, "In-depth analysis of clinico-social and molecular aspects of leprosy among tribal population in central Maharashtra, India" we performed a cross-sectional study in Dharmadoh and Paratwada villages, Chikhaldara block of Amravati district of Maharashtra. Chikhaldara is surrounded by hills and is known as one of the Hill Stations of Maharashtra and has abundance of wildlife and is populated by inhabitants of native tribal population. It is a difficult to reach area where no facility for the medical services, transports are available. This tribal population residing in

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villages have very poor living conditions. This tribal population are mostly uneducated, and hence work as labourer for the educated class in the cities of Maharashtra. It was noted that there was no social stigma for leprosy in the community.

Paratwada, formerly known as Paltanwada and also known as "Achalpur Camp" is a city and a municipal council in Amravati District in the Indian state of Maharashtra. The status of leprosy families in town was very good because of their access to medical facility, transport and living conditions which were better than the tribal population at Chikhaldara. We visited several houses of leprosy cases. In one family, it was noted that Index case who had leprosy was administered MDT. However, suspected household contacts were not investigated and hence did not receive MDT. We screened the family and collected slit skin smear, nasal swab from all in the family and transported the samples to TLM Kothara Hospital. Ziehl-Neelsen staining was performed on the slit-skin-smears and nasal swabs which were found to be positive for Acid fast bacilli indicating that both the contacts were having multibacillary leprosy. Immediately we called the household contacts to TLM Kothara and full clinical assessment revealed that the contacts were also having MB leprosy. After conducting full clinical assessment household contacts were enrolled under MB-MDT regimen. Further, molecular investigations using Polymerase Chain Reaction (PCR) technology of skin-slit-smears and nasal swabs carried out at the Stanley Browne Laboratory of TLM Community Hospital at Shahdara, Delhi revealed that the contacts were also infected with the same type of M. leprae stain which was noted as M. leprae type 1 of subtype D in the Index case (Husband) This case study clearly indicated that how transmission is occurring in the community. Thus, we found household contacts contracting the MB leprosy from a source case in a difficult to reach village populated by tribal population at Chikhaldara of Maharashtra. This emphasises that at this stage of elimination the programme should be more vigilant to identify new cases of leprosy.

A day in the OPD of TLM Purulia

A 17 yr old boy, with multiple impairments, including lagophthalmos, left school after his right hand had paralysis/claw hand due to ulnar and median nerve involvement, suffering since 4 years, seen many practitioners but never diagnosed with leprosy.

Multimorbidity makes treatment challenging! Diagnosis, pill burden, drug side effects, time to cure and economic burden is monumental. I visited TLM Purulia in November, here is a brief write up of the cases I saw within a day. This will help provoke us into thinking about the research needs of present time.
Learning from Clinical Leprosy

01. New face of leprosy – TLMTI can take a similar approach, write a position paper on where and when to use pictures with disability and where not, in consultation with persons affected by HD and other stakeholders, then implement it in its own program.

02. Plenary on neuropathic pain and sessions on neuritis – This is an ignored topic, TLMTI can have a protocol for diagnosis and management and use the DN4 pain questionnaire to classify neuropathic pain.

03. ENL session – ENLIST ENL Severity Scale developed and validated by the ENLIST was tested in ALERT, Addis Ababa and London school of tropical medicine and Hygiene. It was found to be useful as a clinical tool for prognosis in ENL episodes. We could implement it in our program.
04. Neuritis session – Laparoscopic decompression was demonstrated to be easier to perform, faster healing rate and reduced morbidity. TLM can develop a protocol to manage neuritis by using Doppler to classify neuropathy and implement laparoscopic decompression for neuritis.

05. Innovative approaches in leprosy training: the way forward –
- Use of innovative training clinical methods and technology in Leprosy training will help health workers working in rural and remote areas to access latest information.
- Health workers from all corners of the world can be provided Leprosy training by qualified faculty.
- Lack of infrastructure may not be a barrier for such training and learning when technology is used through methods as mentioned.
- Handheld mobile clinical devices with learning apps, e-learning, webinars and tele teaching may be used.

06. Viable M. Leprae (persisters) remain after intensive therapy, including MDT and Monitoring clinical events after RFT – learning from these 2 studies is that disability continues to happen after RFT – Well defined protocols must be developed and implemented across the Global Fellowship implementing countries addressing zero disability and transmission in the post RFT period.
- Risky cohort of high BI cases needs serial monitoring for detection of relapse and thereby tested for resistance.
- Drug resistance management and surveillance is a must.

07. Treatment of erythema nodosa leprosum (ENL) with thalidomide in and out-patient setup - experiences from a semi-urban leprosy referral center in India.
- Time to change In patient policy of thalidomide treatment in TLM?

08. Eye in leprosy:
- Very few papers, encouraged for more studies.
- TMT done by the surgeons - different techniques presented.
- Post RFT events such as Uveitis are sight threatening and require close monitoring and timely intervention.
- Routine screening of Leprosy patients for eye complications by paramedical staff and timely referral and intervention by Ophthalmologist is emphasized.
- We shared about our TLM protocol of screening as best practice.
- TLMTI Protocol can be used for screening for eye complications worldwide.

09. PEP with SDR:
- If PEP programs are designed, then they should be designed for 10 years since it is most cost effective in its 10th year of implementation. Follow up of cases should be done for a long period.
- Feasibility studies in PEP – it is possible to implement PEP if the public health facilities are robust in mapping, case finding, screening and follow up.

Most of the studies showed that LPEP programs can be operationalized within the public health system. TLM should do a situation analysis and design interventions for systems strengthening.

Learnings from basic science research

01. Session - Relapse
- In relapse cases BI fluctuate from negative to positive and relapse patients do responded well with re-treatment MDT.
- There is an urgent need of laboratory tool to confirm diagnosis of relapse in field situation.

02. Session - Learning from Vaccine
- There is need to develop future studies to assess the efficacy of the recombinant vaccine (Lep Vaccine) for the prevention of leprosy as well as adjunctive immunotherapy to multidrug treatment.
- Need to develop MIP trials because it enhances bacterial clearance in high BI cases.

03. Session - Molecular epidemiology and transmission pattern and session Drug resistance Surveillance
- M. Leprae is present in leprosy patients, household contacts and soil samples in leprosy patient’s inhabitant area.
- Household contacts can be asymptomatic carriers of M. Leprae and contributing factor for transmission without developing leprosy.
- PCR positive contact should be administered with SDR followed by BCG. (Milton Moraes)
- There is significant VNTR-Clusters in geographical association
- Molecular epidemiological techniques can give valuable insights into the dynamics of leprosy transmission,
- VNTR should be used along with SNP typing for better understating the transmission patterns.
- Leprosy case-household contact pairs can aid in understanding transmission pattern using the SNP based genotyping.

It was found that M. Leprae can be found in the environment or may remain sub clinically in the healthy household contacts, which can be a potential reservoir for the leprosy transmission.
- The transmission molecular tools are very useful in tracking leprosy transmission, but due to its limitations new tools has to be discovered.

04. Session - Molecular diagnostics
- Droplet Digital PCR assay showed greater sensitivity in detecting M. Leprae DNA in PB patients compared with qPCR. (Dr. Hong Liu)
- A more efficient diagnostic test based on qPCR could be designed for early diagnosis of leprosy.
- TLMTI’s MPCR is better tool for diagnosis of leprosy cases and asymptomatic or subclinical individuals.
- By using system biology approach 70 genes of armadillo showed homology with humans during leprosy progression. Prediction of ABEL tool/software for the assessment of risk prediction in humans.
1. **Mr. Vikram Singh** won "Junior Scientist award" in the National Conference "Channeling as tools and Techniques to Agriculture Biotechnology, Microbiology and Molecular Biology" held at Mathura from 24th to 25th Nov 2019 which was organized by Kalp Laborataries India.

2. **Mr. Karthikeyan** from TLMTI presented a poster on "Computer Assisted Customized Footwear and Traditional Micro-Cellular Rubber (MCR) Footwear: A Comparative Study" in the 2nd World Conference on Advanced Treatments and Technologies in Wound Care, Dusseldorf, Germany held from 24th and 25th October 2019.

3. **Dr Itu Singh** presented an overview of SBL Research at 2nd annual meeting of "The Belt and Road" International Forum for Leprosy Precision Treatment and Prevention which was held at Institute of Dermatology, Chinese Academy of Medical Sciences & Peking Union Medical College, National Center for STD and Leprosy Control, China CDC, Nanjing, China from 6th to 9th November, 2019.

4. **Ms Madhvi Ahuja** presented a poster titled "Whole-Genome Sequencing of relapsed leprosy patients from India" was held at the 9th 2019 NEXTGEN Genomics, Biology, Bioinformatics and Technologies Conference from 30th September to 2nd October 2019 in Mumbai-India which was sponsored by SciGenom Research Foundation (YUVA Scholarship).

5. **NNN conference, Liverpool** - A research proposal from TLMTI was presented by Dr Joydeepa on innovation in NTD was shortlisted for the final round of selection, funded by ALM.

6. **ILC 2019** - Plenary session – on Recent advances in the management of Type 2 reactions. Field and social science research presented 21 oral and 22 poster and the Stanley Browne Lab presented 6 oral and 10 posters.

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**Singh V, Turankar RP, Goel A. Molecular characterization of environmental mycobacterial species from leprosy endemic tribal regions of North Purulia District, West Bengal. Int J Mycobacteriol 2019; 8:381-9.**

**Abstract:**

Background: The aim of the present study was to isolate and characterize nontuberculous mycobacteria (NTM) on Lowenstein–Jensen media supplemented with glycerol or pyruvate on two different temperatures from soil samples from leprosy endemic tribal areas of Purulia.

Methods: Mycobacterium leprae DNA was isolated from these samples followed by polymerase chain reaction (PCR) amplification using RLEP gene target specific to M. leprae. DNA was extracted from NTM cultures by lysis method. The presence of Mycobacterial DNA was confirmed by PCR using universal mycobacterial primer as 16S rRNA. NCBI nBlast was used for the authentication of NTMs, and phylogenetic tree was constructed using M. leprae and NTM species. Statistical Analysis Used: The percentile method and phylogenetic tree were used as statistical tool in this research article.

Results: The rapid-growing mycobacteria (RGM) species, 4 (80%) was obtained more than that of slow growing mycobacteria (SGM) 1 (20%) supplemented on glycerol at 30°C followed by SGM species 8 (62%) were recovered more than RGM at 37°C. Similarly, SGM species 2 (100%) were recovered on supplemented with pyruvate at 30°C and no RGM growth when supplemented with pyruvate. Further, the recovery of RGM species 3 (60%) was better on supplemented with pyruvate than SGM species at 37°C.
Mycobacterium timonense was first time isolated from Indian soil samples. Highest numbers of NTM were isolated from bathing place than washing and sitting places along with M. leprae PCR positivity. Phylogenetic tree showed a close genetic evolutionary association between Mycobacterium simiae and M. leprae in the leprosy endemic environment.

Conclusion: Several NTM was isolated from soil of leprosy endemic area which might have role in susceptibility of leprosy. Phylogenetic tree revealed a closed association of M. simiae with M. leprae in the environment and might be maintaining the leprosy endemicity in north block of Purulia.


Abstract: The management of Erythema Nodosum Leprosum (ENL) reactions is a challenge as the condition is chronic and recurrent, and requires treatment for a prolonged duration. The exact cause for ENL has not been ascribed, though high bacillary or antigen load perpetuates the immunological reaction. In this article, we report a case of lepromatous leprosy (LL) who presented with recurrent ENL reaction recalcitrant to therapy. Work-up showed rifampicin resistance as a potential cause for the repeated reactions and the patient responded dramatically to an alternative anti-leprosy regimen.


Abstract: While Type 1 reaction in Hansen’s disease is commonly encountered, the triggers and reasons for its persistence are not well understood even though the immunological milieu and cytokine interplay have been studied. Herein, we present a case of Type 1 downgrading reaction in which multidrug resistance was the probable cause of steroid-nonresponsiveness and which responded promptly on starting alternate antileprosy treatment.


Abstract: Introduction: Leprosy still remains a public health problem in India. Stigma and associated psychosocial problems are common in leprosy and may affect the quality of life (QoL). This study aimed to assess the QoL of the person affected by leprosy living in Purulia district, West Bengal.

Methods: A cross-sectional study was conducted among 358 persons affected by leprosy above the age of 18 years and who were reporting at tertiary leprosy referral hospital, Purulia, West Bengal, from April to July 2017. The World Health Organization QoL (WHOQOL-BREF) scale was used to measure the QoL and the scale had four domain: physical health, psychological health, social relationship, and environmental health.

Results: Of the 358 respondents, 41% were female, 60% were aged between 18 and 45 years, and 58% were literate. Half of the participants (55%) were farmer and labor, and 75% of the participants’ family income was below Rs. 5000 per month. One hundred and forty-four (40%) participants had physical disability. There was a highly significant difference seen among the person affected by leprosy between those with visible deformity and no deformity in four domains. The participants with visible deformity had lower QoL than the person without deformity.

Conclusion: The study observed that the person affected by leprosy with visible deformity had lower QoL. Early detection and management would prevent the deformity and might improve the QoL of persons affected by leprosy.
