

# Missed / Misplaced / Late Abstracts

L-14

## Nerve Regeneration and Repair

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If the axon is spared, such as in first-degree injury, conduction is interrupted due to demyelination, but it is reinstated whenever the aggravating stimulus is removed and the myelin layers are restored. If the axon, or more, is transected, causing a second to fifth-degree injury, the response has two main phases i.e. degeneration and regeneration, taking substantially longer. The degeneration is known as Wallerian degeneration. The changes that occur in the axon, cell body and the Schwann cell covering of the nerve, help in the preparation ready for regeneration. Distally, the axon begins to disintegrate and undergoes apoptosis, releasing vesicles of cytosol and organelles. This same process occurs proximally and is stopped by the regeneration process. The local Schwann cells with macrophages, that migrate across the local vessels and clean up the apoptotic debris, create long, clean, endoneurial tubes. Schwann cells begin to proliferate and organize themselves into columns that lie within the endoneurial tubes, creating what are known as the bands of Bungner. The motor end-plates disappear at the neuromuscular junction. While the distal portion of the nerve is being cleared and prepared for reinnervation, the proximal portions of the neurons are going through a process of regeneration. Immediately after injury, the cell body swells, the nucleus becomes hypochromatic and increases the production of mRNA and proteins instead of neurotransmitters. These products are transported down the axon, providing the material and energy for nerve elongation to the distal tip. While the cell body is busy making raw materials, the newly severed axon end begins to sprout, initially sending out transient axonal processes that are retracted and replaced by more permanent filopodia that contain a cytoskeleton and are capped by an expanded region known as the growth cone (it seems that each axon produces about 30 sprouts). The growth sends out many small processes that seek specific markers, which influence the axon in its movements to preferentially select neural tissue and even exhibit a preference for endoneurial tubes that have the same function (neurotropism). For instance, when a motor axon reaches a nerve gap, it moves across small gaps into the severed distal end and finds a motor tube to begin growing down. Although this does help to preserve function, it is, unfortunately, not specific enough to recreate innervations identical to those that existed prior to injury. The axon's response is known to be regulated by chemical signals that exhibit neurotropic and neurotrophic influences. Neurotropic factors are responsible for directing and attracting the regenerating axons. Neurotrophic factors are involved in inducing the maturation and elongation of the axon. Macrophages, Schwann cells, and other supporting cells in the area release these chemical factors and attempt to create a microenvironment that promotes axon elongation. Limits exist on directing axon regeneration e.g. if the nerve is too close, the axons cannot exhibit specificity of function, causing severely aberrant patterns of innervation at an end organ level.

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L-35

## Risk Factors for the Development of Nerve Impairment

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The focus will be on clinical risk factors and changes in nerve status identified by monofilament or voluntary muscle testing. The presentation will include a summary of risk factors reported in published work and discussion of the impact of differences in clinical definitions and in statistical approaches. Where available, the predictive value of the reported risk factors will be assessed using data from the INFIR cohort study.

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Temporalis muscle transfer (TMT) is a surgical technique that can be used to correct lagophthalmos in patients with facial nerve involvement in leprosy. This retrospective study of TMT in 73 eyes was conducted in order to determine the degree of success of TMT in achieving full lid closure, therefore preventing damage to the cornea. The average lid gap on light closure was 7.10mm preoperatively and 2.67mm postoperatively. The average lid gap on tight closure was 4.29mm preoperatively and 0.20 mm at discharge post- TMT. At discharge, 85% of the eyes could achieve full lid closure with no measurable gap. **Key words :** Temporalis muscle transfer in leprosy.

### The Histological Diagnosis of Leprosy Type I Reactions : Identification of Key Variables and an Analysis of the Process of Histological Diagnosis

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This study identified the variables that pathologists use to make a diagnosis of Type 1 leprosy reaction. **Design :** Prospective study in India with skin biopsies taken from 99 patients with clinically diagnosed reactions and 52 non-reactional controls. These were assessed by four histopathologists. **Results :** Reactions were under-diagnosed with 32-62% of clinically diagnosed reactions being given that histological diagnosis. The pathologists had good specificities (range 72%- 93%) but poorer sensitivities (range 42-78%). The major histological features of T1R were cell maturity, oedema and giant cells. Five variables were used to diagnose reactions: intra-granuloma oedema, giant cell size, giant cell numbers, dermal oedema and HLA-DR expression. A predictive model for the diagnosis of T1R was developed using stepwise logistic regression analysis with clinical diagnosis of reaction as an outcome and then identifying the key variables that each pathologist used, 34-53% of the variation between pathologists could be accounted for. The four pathologists had similar diagnostic models and their estimations of epithelioid cell granuloma oedema, dermal oedema, plasma cells and Granuloma fraction estimation were significant variables in diagnosing T1R. Each pathologist then added in variables that were specific to them. **Conclusion :** T1R are histologically under-diagnosed and has identified key variables for diagnosing T1R.

### The Clinical and Histological Diagnosis of Reactions in Patients with Clinically Diagnosed Multibacillary Leprosy- the INFIR Cohort

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We report on three aspects of histological diagnosis from the INFIR cohort (n=303). **Diagnosis of leprosy :** The BT diagnosis group was heterogeneous with 59% being confirmed histologically, 13% were re-assigned to BL, 2 to LL, 32 and 15 to indeterminate and NSL respectively. **Indeterminate/Resolved leprosy :** 62 patients had a diagnosis of indeterminate or no significant lesion (NSL) on biopsy. The final classification for this group of 62 patients was BT 50, BL 3, BT (PN) 4 and BL (PN) 5. **Clinical and Histological Diagnosis of reactions :** The histopathologist diagnosed 52%, 39 and 9% of the BT, BL and LL patients as being in T1R. Clinicians diagnosed T1R in 36 patients whereas using histology a further 63 patients were diagnosed in T1R; in 18 patients there was a clinical diagnosis of T1R without histological confirmation. **Conclusions :** 1. The MB diagnostic group is very heterogeneous. 2. Indeterminate/ resolved leprosy is a substantial category. 3. Reactions are diagnosed differently by clinicians and histopathologists. 4. For research it is important that pre-agreed gold standards are used.

**O-301**

## **Disability Prevention & Rehabilitation Services – An Integrated Approach**

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More Emphasis is paid on Disability Prevention and Medical Rehabilitation (DPMR) services under National Leprosy Eradication Program (NLEP) during 11<sup>th</sup> five year plan. Participatory and integrated approach is the main principle. Basic services of nerve function monitoring, management of Leprosy Reaction & Neuritis (LR/N) and ulcer care will be provided by General Health Care (GHC) staff at primary and secondary level. Cases requiring surgery and complication management will be referred to tertiary care centers. Operational Guidelines and standardized training modules for different categories prepared by experts have been issued. Enough provision of Prednisolone, MCR foot wear and other aids have been made. Inter-ministerial links have been developed. NRHM umbrella has been taken as opportunity. PMR departments of Medical colleges have been involved. Support to NGOs, community based organizations and ILEP agencies to strengthen CBR and development of Self Help Groups is well considered. Networking of Disabled Peoples Organizations (DPO) and NGOs will further promote the Disability Prevention and Rehabilitation services.

**O-302**

## **Off Loading the Foot in Leprosy**

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The normal foot is well protected from abnormal pressure due to feeling of pain & discomfort. One of the most disabling sequel of leprosy is the deformed foot due to motor weakness, sensory loss and dryness. This leads to ulceration, chronic infection & disintegration of small bones of the foot. It is essential to understand the mechanism of ulceration & management with the help of various techniques of off loading/weight relieving from foot. Every leprosy individual should be taught self care of foot & emphasis should be given for selection of proper footwear.

**O-303**

## **Survey of Leprosy Colonies in India**

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IDEA India was responsible to conduct the survey of leprosy colonies in India. The process of identifying the States for the study was started in 2005 June and in July the coordinators and field worker to collect the data in 23 states was finalised. The Nippon Foundation, Japan provided necessary funds to carry out the survey. A questionnaire was prepared by Dr.P.K.Gopal and it was translated in local languages by the respective State coordinators. One questionnaire was used for all the 23 States to collect data. The work involved 23 states with 12 different languages and was done by a team of workers and coordinators. The survey identified 631 self settled leprosy colonies in India. Our concern was mainly the affected persons and as such, the non-affected persons were not dealt in detail. The total number of children affected by leprosy is 10941. The point to stress is that 27368 persons are begging. This what we are more concerned with, since more than half of the population has no income except by way of begging. The leprosy colonies in eastern states have less number of people and economically backward. The leprosy colonies in Maharashtra State are economically better. In the leprosy colonies in the Northern states many people who migrated from Southern part of India are found. They moved to North due to high level of stigma in the South.

P-373

## Leprosy Cannot be Eliminated Why ?

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Declining trends of NCDR is not observed through out the world. No reliable tool to accurately measure sub clinical infection. Either the dynamics of transmission or the early evolution of disease in leprosy not yet understood. Clinical and epidemiological study during the year 1991-1995 revealed basic science and unrecognised clinical features. Four major criteria are used to diagnose. All human deceases are the outcome of basic leprosy manifestation, types of deceases and clinical manifestations is determined by genetic constitution. Upset in Thridoshas can be discussed as metabolic and morphological changes by infestation of leprosy. Leprosy affects all organs through direct invasion on nerve cells and endothelial tissues. Also affects organs through mediators like prostaglandin, kinin and neuro transmitters. It may be responsible for immuno modulation and oxidative changes in *tissues*. Man gets leprosy infection *during* conception after birth at any time. All are born with leprosy, living with leprosy and dying with leprosy. We failed to co-relate the science symptoms of decease with leprosy till date. CLTRI study using PGL-I antibody test reveal all population examined is positive for the test, noting 100% infection. Elimination of leprosy means elimination of mankind.

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P-374

## Worldmaking Ventures by Leprosy Combatants in Anandwan : A Case Study

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Leprosy combatants and their allies have launched into a joint program of worldmaking at Anandwan in Warora in the district of Chandrapur in Maharashtra in Central India. In the course of this paper an effort is made to appreciate and understand the attempts made by leprosy combatants to search for coherence and continuity in their lives. The focus of our narrative is one Mr. Tukaram Urade, a guy inspired by the vision, teaching and praxis of the world renowned Baba Amte, one of the few surviving close companions of the late Mohandas Karamchand Gandhi better known as Mahatma Gandhi. Tukaram says, "in the mid 1960's he began to notice some white patches on his body. Initially no one gave much importance or attention to these minor signs of a major thing to come. He says, 'prior to me there was no one in our family who had any history of leprosy'. As days, weeks, months and years went by, his situation began to change. Intake and application of local herbs on the affected parts of his body showed no positive effects. Native healers known to effect cures through mantras and spiritual exercises were unable to set things right for Tukaram. Having tried and failed to get going, gutsy guy that he is, 'Tukaram decides to give yet another try and arrives at Anandwan on April, 1, 1969. He says "from April 1 to August 15, I stayed at Anandwan, received timely treatment, got rid of the wounds and sores, loved the place and decided to live and work with fellow combatants for the rest of my life. On August 16. I left for Somnath and remained there till 1973. In the beginning we were 14 members in the Somnath team, transforming Somnath into Anandwan's main hub for agricultural enterprise". Somnath has become the "Rice Bowl" of Anandwan and its communes says Tukaram, now happily enjoying the fruits of his retirement in Anandwan. **Key words** : Anandwan. leprosy. disability. Baba Amte. empowerment. worldmaking.