

SUCCESSFUL TREATMENT OF OSTEOMYELITIS IN LEPROSY PATIENTS BY HOMEOPATHIC MEDICINE

D. Chakraborty*, T. Chakraborty¹ J. Sengupta

ABSTRACT: Osteomyelitis, a major complication of neuropathic feet in leprosy may occur as a result of infiltration of *Mycobacterium leprae* in the periosteum of bones or due to secondary bacterial infection of chronic plantar ulcer. There is no effective treatment for healing of planter ulcer and osteomyelitis. Keeping in mind of the limitation of conservative treatment, twenty patients who completed with multi drug therapy but suffering from neuropathic foot with ulcer was treated with *Mercurius solubilis*, a homeopathic medicine in 200 potency for one year. All these patients had different degrees of osteomyelitic changes and after treatment showed regeneration and remodeling of bones which may be considered as significant improvement. Based on the radiological finding it may be concluded that *Mercurius solubilis* found to be effective in the treatment of osteomyelitis in leprosy affected patients.

Key words: Leprosy, Osleomyelitis, Homeopathic treatment.

INTRODUCTION

Infection with the *Mycobacterium leprae* causing infiltration of the skin and Schwann cell may result in nerve function impairment (NFI) (Mario *et al.* (2002), Slim *et al.* 2008). In the lower extremities, nerve impairment can lead to a so-called 'neuropathic foot' (Faber *et al.* 1993, Morrison *et al.* 1998, Kapoor 2007). Ulceration and infection (cellulitis or osteomyelitis) are important complications of 'neuropathic foot' (Maas *et al.* 1999, Brandsma *et al.* 2001). Repeated injury secondary to the neuropathy may lead to tarsal disintegration with osteolysis, fragmentation and progressive bone resorption. In extreme cases, dissolution of the mid-foot results in separation of the forefoot and the hind foot, changing all biomechanics and weight

bearing areas (Jacob and Patil 1999, Brandsma *et al.* 2001).

Altered biomechanical forces, which often occur in combination with osteoporosis, can cause damage to the skeleton, and can eventually result in neuro-osteoarthropathy (Charcot deformity) of the foot (Faber *et al.* 1993, Van Brakel 2000, Brandsma *et al.* 2001, Illarramedí *et al.* 2001, Jacob and Patil 1999). The bone prominences and the plantar surface of the foot are vulnerable for repeated trauma, resulting in callus and ulceration. Osteomyelitis is often related to ulceration and may lead to amputation (Macdonald *et al.* 2001, Berendt and Lipsky 2004).

Little is known about the exact pathogenesis of osteomyelitis that developed in the

Institute of Health Studies & Rehabilitation, 27 Tagore Avenue, Durgapur 713204, West Bengal, India.
¹ *Regional Disease Diagnostic Laboratory (ER), Institute of Animal Health & Veterinary Biological, Kolkata – 700 037, West Bengal, India.*

*Corresponding author

neuropathic foot ulcer. It is claimed that appropriate footwear and good foot management can prevent the development of foot ulcers, and the development of ulcer-related complications still recurrence of such foot ulcers is a major problem in leprosy affected persons (Brandsma *et al.* 2001).

Different clinical trials have demonstrated that *Mercurius solubilis*, a homeopathic medicine has got potential to cure plantar ulcer and histopathological evidence has also demonstrated regeneration of nerve fibers in such cases. Radiological study of the leprosy cases with plantar ulcer also showed remarkable improvement in bony pathology (Chakraborty and Chakraborty 2000, Chakraborty *et al.* 2009).

In this study, an effort was taken to treat twenty leprosy affected persons who have completed multi drug therapy but suffering from foot ulcer and osteomyelitis treated with a homeopathic medicine *Mercurius solubilis* and the finding recorded are presented in this communication.

MATERIALS AND METHODS

Twenty leprosy affected persons who have completed multi drug therapy having anesthetic hand and feet with ulcer reported to the OPD of Institute of Health Studies and Rehabilitation during the period from January to December 2009. All the patients were subjected to detailed examination. The physical examination was undertaken by a dermatologist who is specialised in neuropathic foot pathology and by a Radiologist. The physical examination and follow-up study was performed by the same dermatologist. The clinical assessment of the foot deformities was based on consensus. Nerve function impairment was diagnosed as an impaired 10-gram force filament test (Semmes-Weinstein filament) as described by Ramu (1997). Signs of inflammation in the foot were

evaluated by palpation of the skin on the forefoot of both feet following the procedures described by Hoeksma and Faber (2000). For both feet, detailed information were recorded with regard to ulcer size and aspect, dryness of the skin, foot and toe deformities, callus formation, fissures, oedema, redness and increased temperature. Details on the type of footwear used by the patients were recorded. Patient files were used to record information on all foot problems and treatment during the follow-up period.

All the patients were given *Mercurius solubilis*, a homeopathic medicine in 200 potency in liquid *per os* once in a week for one year. On the first day of treatment, the ulcer was subjected to thorough cleaning with ordinary soap and water, surgical spirit and calendula Q and thereafter dressing with dry gauge pack daily or every alternate day as required till complete healing. All the patients were subjected for radiologic examination before and after treatment.

RESULTS AND DISCUSSION

Out of the twenty cases the clinical signs, ulcer type and radiological interpretations of representative five cases are presented.

Case – 1

A male patient of 45 years with lepromatous leprosy had completed full course of multi drug therapy of multi bacillary regimen (MDT – MB) for 1 year in the year 2005 reported high fever with deep complicated ulcer on fourth toe of right foot (Fig.1). Pain and swelling of right foot with profuse thin offensive discharge from the ulcer was conspicuous with inflammation of right inguinal lymph gland. The patient was presented with multiple ill defined, hypo-aesthetic, macular lesion with loss of perspiration and loss of hairs in different location of the body.



Fig.1: Ulcer in 4th toe in right foot (before treatment).



Fig.2: X-ray of right foot showed lytic and sclerotic change of tarsal and metatarsal bone (before treatment).



Fig. 3: Ulcer healed (after treatment).



Fig. 4: Remodeling and regeneration of bone (after treatment).

In slit skin smear Acid fast bacilli (AFB) was not found.

Radiograph of the right foot taken before the treatment showed indemniy of the base of first metatarsal and lytic and sclerotic change in the medial and intermediate. Tarso metatarsal joint was irregular. Small bone fragment were seen.

Soft tissue swelling was also conspicuous.

Osteitis and periostitis caused by leprosy has lead to Lytic and sclerotic changes in the tarso-metatarsal and metatarsal region on medial side leading to reduction in equibity and breaks in tarso metatarsal joint and adjacent tarsal and metatarsal bone (Fig.2:).



Fig. 5: A complicated deep ulcer seen on a right foot of a leprosy patient.

Case - 2

A male patient of 35 years who was diagnosed as a patient of Boderline lepromatous leprosy reported with deep complicated ulcer on right foot accompanied with pain and profuse discharge with offensive smell. Clinical examination revealed multiple erythematous lesion present all over the body. Both the tibial and peroneal nerves were found thick and tender. The patient completed full course of MDT – MB for 1 year in the year 2002, but was suffering from recurrence of ulcer for last 10 years in his anesthetic feet in spite of time to time antibiotic treatment.

Radiograph of the right foot taken before the

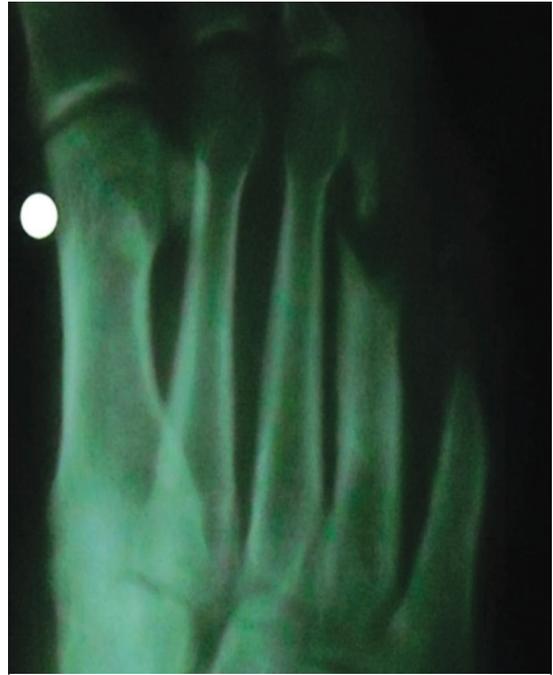


Fig.6: Radiography showed pathological fracture with Osteomyelitic changes seen of the right fourth and fifth metatarsal with narrowing of shafts suggestive of neurotropic disorder.

treatment showed sclerosis of First metatarsal bone, with dislocation. Lysis of second and third metatarsophalangeal joint sclerolysis. Loss of metatarso-phalangeal joint with dislocation was seen . Lysis of the phalanges of fourth and fifth toe with lysis of head of fourth and fifth toe was recorded.

Case - 3

A male patient of 36 years reported deep complicated ulcer on the left foot with profuse offensive discharge with pain. History of the patient revealed that the case was diagnosed as Boderline Lepromatous Leprosy and completed full course of MDT–MB for 1 year in the year 2002. On clinical examination of the patient,



Fig. 7: Ulcer completely healed within six months.

macular, shiny, hypo-pigmented, hypo aesthetic patches were found all over the body. Involvement of tibial and peroneal nerves were also seen. The patient was suffering from recurrence of ulcer for last five years.

Radiograph of the left feet revealed sclerosis, thinning and lysis in distal phalanges of great toe. Disorganized first metatarsophalangeal joint with fracture of head of first metatarsal and sclerosis. Loss of phalanges of second toe with sclerotic of head of second metatarsal and thinning of shaft. Lyses of dorsal phalanges of third toe with sclerotic of proximal pharynges of third metatarso-phalangeal joint. Reduced joint of fourth toe at metatarsophalangeal joint



Fig. 8: Radiography of right foot it is evident that no osteomyelitic changes seen on fourth and fifth right metatarsal bone. Remodelling of metatarsal bone is evident.

with losing of shaft of fourth proximal phalanges. Tarso-metatarsal and metatarsal joint were found normal.

Case - 4

A Lepromatous leprosy patient of 46 years was presented with multiple copper colored nodular lesion on the whole body. Both ulnar and peroneal nerves were found thick and tender (Fig.5). The patient was having a deep complicated ulcer on distal extremity fourth and fifth toe of right foot. The patient completed full course of MDT-MB for 1 year in the year 2000.

Radiograph of the right foot revealed

osteomyelitic changes of fourth and fifth metatarsal bones with narrowing of shaft, suggestive of neurotropic disorder (Fig.6).

Case - 5

A patient of lepromatous leprosy of 37 years reported with complain of recurrent planter ulcer. History of the patient revealed that he has been suffering planter ulcer for last 11 years. Clinical examination revealed chronic small multiple ulcer with thin offensive discharge and shortening of toes of both feet. Swelling of both feet with pain was also reported. Well defined hypo-pigmented hypo-aesthetic patch was noticed on left hand with involvement of multiple nerves. The patient completed full course of MDT-MB for 1 year in the year 2000 and received treatment for ulcer in different times.

Radiograph of the right foot revealed disorganized and dislocated of first metatarsal, with sclerotic changes. Loss second metatarsophalangeal joint due to lysis with sclerotic changes and loss of third metatarsophalangeal joint with dislocation were noted. Lysis of the phalanges of fourth and fifth toe with lysis of head of fourth and fifth toe was noted.

Radiograph of the left foot showed disorganized, first metatarsophalangeal joint with lysis and sclerotic changes of metatarsal and phalanges. Second metatarsophalangeal joint was found fused. Lysis of third metatarsal head and phalanges were also noted. Lytic and sclerotic changes in fourth and fifth metatarsophalangeal joints and phalanges were seen.

Result of treatment

Case - 1

Hypo-aesthetic, macular patches disappeared with regain of touch and pain sensations. The condition of the right foot was found improved.

There was no swelling in the right foot. The ulcer completely healed up after three months of treatment (Fig.3).

Radiograph of the right foot revealed sclerosis and lysis completely disappeared. Tarsal bone (medial and intermediate) regained and its shape partially. Alignment of first tarso-metatarsal and metatarsal joint was more anatomical. Joint surface appears smooth. Bony fragments are not seen. Soft tissue swelling is not seen. Remodeling of the bone was found (Fig.4).

Case - 2

Multiple erythematous lesion which were found to be present all over the body disappeared after treatment. Partial regain of sensation was also noticed. The ulcer was found to be completely healed up. The patient reported to work routine manner.

Radiograph of the right foot showed disappearance of sclerosis with alignment first metatarso-phalangeal joints and phalanges. Second and third metatarso-phalangeal joint showed formation of new joint in the remaining portion with re-location of joint. Fourth and fifth metatarsal showed restoration of sclerosis with removal of dead bone.

Remodeling of metatarsal and phalanges was seen with relocation and regaining of the alignment of the metatarsal head and phalanges.

Case - 3

Clinical examination of the patient showed absence of macular, shiny, hypo-pigmented, hypo aesthetic patches which were found all over the body before onset of treatment. Involvement of tibial and peroneal nerves were unremarkable. The ulcer completely healed up.

Radiograph of the left feet showed marked reduction of sclerosis in the first

metatarsophalangeal joint. Sclerosis was found to be resolved in first metatarsal, second metatarsal head and proximal pharynges. Second metatarsal head was found with growth of new bone. Third metatarsal phalanges joint showed restoration of sclerosis with normal joint alignment. Fourth metatarsal phalanges were in line. Overall picture showed healing of the bone with re-growth and formation of joint at metatarso-phalangeal joint with removal of dead bone with realignment.

Case - 4

Clinical sign revealed no nodular lesion which was recorded before treatment. The ulcer completely healed up (Fig.7)

Radiograph of the right foot revealed no osteomyelitic changes of fourth and fifth metatarsal bones. Remodeling of the metatarsal bones was evident (Fig.8).

Case - 5

All the hypo-pigmented hypo-aesthetic patches disappeared. The ulcers in both the feet were completely healed up.

Radiograph of the right foot showed first metatarsophalangeal joints and phalanges without sclerosis and normal alignment. Second and third metatarsophalangeal joint showed formation of new joint in the remaining portion with relocation of joint and fourth and fifth metatarsal showed lack of sclerotic changes with removal of dead bone.

Radiograph of the left foot showed absence of any sclerotic change. Alignment was restored in the remaining portion of the metatarsophalangeal joint along with removal of dead bone seen.

Osteomyelitis is a major complication of neuropathic feet is a problem in leprosy (Schon

*et al.*1998, Mass *et al.* 2001, Maas *et al.* 2002). Little is known about the exact mechanism of the first complication that develop in the neuropathic foot. However, available literature suggested that *M. leprae* itself can cause osteomyelitis (Patterson and Rad 1961, Resnick and Niwayama 1995). Infiltration of *M. leprae*, during spreading from overlying dermal or mucosal areas, initially affects the periosteum (leprosy periostitis) and subsequently the adjacent cortex and spongiosa (leprosy osteitis). Osteomyelitis may also occur in neuropathic feet due to chronic planter ulcer associated with secondary bacterial infection.

In leprosy, conventional treatment of planter ulceration includes debridement of devitalised tissue, adjustment of non-weight-bearing by means of a total-contact cast or bed rest and the vigorous treatment of secondary infection, which is most commonly caused by *Staphylococcus aureus*. Bony involvement may require multiple debridement and sometimes excision. It is believed that a planter may heal well if weight-bearing is prevented as they have good vascular supply unlike those in diabetic neuropathy. Once healing takes place, walking must be limited and only increased slowly. Areas of bony prominence which may lead to ulceration are removed surgically. Still in most of the cases, these ulcers lead to amputation due to gross destruction of bones and joints (Moonot *et al.* 2005).

Chronic osteomyelitis generally requires both antibiotic and surgical treatment (Lazzarini *et al.* 2002). But, despite continued research, most aspects of antibiotic treatment for osteomyelitis are still poorly understood. Data are sparse about which are the most effective antimicrobial agents, for how long, and by what routes they should be administered for various types of osteomyelitis. Animal models have been useful in studying this complex disease, but they cannot

replicate many aspects of human bone infection. Most authorities believe that an incompletely debrided bone infection is prone to treatment failure, no matter what antibiotic therapy has been used (Waldvogel 1988, Mader *et al.* 1997, Lazzarini *et al.* 2002). Radical debridement of infected or necrotic bone is even more important in the compromised host (Simpson *et al.* 2001).

Thorough scrutiny of available literature confirmed the fact that osteomyelitic changes occur in leprosy appears to be irreversible by conventional treatment, but all the twenty cases treated so far with *Mercurius solubilis* showed marked improvement in osteolytic bones.

Remodeling of bone and regeneration was conspicuous change noted though all the patients were advised for normal activity. Irrespective of the size of ulcer or degrees bony changes, progression of the condition was not found in any case.

CONCLUSION

Osteomyelitis, a major complication of neuropathic feet is a problem in leprosy. There is no effective treatment for healing of planter ulcer and osteomyelitis and rest of the affected part by means of a total contact cast or bed rest and the vigorous, repetitive treatment of secondary infection is advised to prevent further destruction of bones and joints. *Mercurius solubilis*, in this study has brought out the scope non-invasive and cost effective treatment option in the treatment of plantar ulcer and osteomyelitis in neuropathic feet in leprosy affected persons without any bed rest. This study has also brought out the possible integrated approach in such clinical conditions where best out of different therapeutic modalities could be used.

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