

A CLINICAL STUDY OF PLANTAR ULCERS IN LEPROSY

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ABSTRACT

BACKGROUND

Deformity prevention is one of the top priorities in leprosy elimination programme. Plantar ulcer and foot deformities are commonly seen in leprosy patients causing considerable physical disability. This can be prevented by early and regular MDT, proper practice of feet care, correction of deformities and management of infections. The study was to assess the above factors contributing to the development and recurrences of plantar ulcers among our leprosy patients.

MATERIALS AND METHODS

66 leprosy patients with plantar ulcers were evaluated for delay of treatment, practice of feet care, site of ulcer, concomitant deformities and bone changes. Identification of infective agent is done by culture and sensitivity test.

RESULTS

Majority of patients belonged to the borderline spectrum. Delay in starting anti-leprosy treatment ranged from 2 months to 12 years. The main reasons for the delay in treatment are the patients ignored the lesions because they are asymptomatic or treatment with other modalities like homeo/ayurvedic drugs. 92% of patients studied were not practicing feet care. Common site of ulcer was beneath the heads of metatarsals and big toe. Foot drop was seen in 15% and claw toes in 33%. Osteomyelitis observed in 20% of patients. Common pathogen isolated was staphylococcus seen in 75% of cases followed by Streptococcus and Klebsiella. 50% of Staphylococci isolated were found to be penicillin resistant.

CONCLUSION

The occurrence of plantar ulcers and its complications are not an inevitable sequelae of leprosy and is totally preventable if appropriate measures are undertaken.

KEYWORDS

Plantar Ulcers, Deformity, Leprosy.

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BACKGROUND

Leprosy is a chronic mycobacterial disease primarily affecting the peripheral nervous system and secondarily involving the skin and certain other tissues.¹

It is more feared than the killing diseases and the horror and dread of the disease is rooted in the deformities that can result from it and that remain even after the disease is arrested and prevent a return to the normal life.^{2,3} The deformities of the feet is the most common disability.^{4,5} Plantar ulcers are seen in 10-20% of the cases of leprosy.^{2,3,4} These ulcers are relatively painless, very slow to heal and quick to recur.^{5,6} These recurrent plantar ulceration and its complications are responsible for a progressive destruction of the feet.^{7,8,9} This is preventable by early diagnosis and prompt treatment of the disease and proper

health education.^{10,11,12} Skin lesions of leprosy are usually asymptomatic and so patients do not seek early treatment. Also, delay occurs when they go for other type of nondirective treatment. Even in patients with sensory loss of feet, ulcer can be prevented by use of protective foot wear, application of emollients, controlled walking and adequate rest.^{13,14,15} The present study was to assess the practise of feet care and also to find out the common sites ulceration, bone changes and the common infective agent causing secondary infection.

MATERIALS AND METHODS

The study was carried out in the Department of Dermatology and Venereology, Medical College Hospital, Trivandrum. 66 patients of Hansen's disease with plantar ulcer were subjected to the study.

The age, sex, socioeconomic status and occupation of the patients were noted. Detailed clinical history regarding the duration of the disease with special reference to the delay in starting treatment and the reasons for delay and details of anti-leprosy treatment were noted.

The practice of feet care, use of footwear and the complaint if any on using the footwear noted. Detailed clinical examination of the plantar ulcers regarding the site and depth of ulcer, type of discharge and associated motor paralysis of the foot. Like

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footdrop, inversion deformity or claw toes if any were also recorded. Determination of infective agent was done by pus culture and sensitivity tests. X-ray of both anteroposterior and lateral views of the feet taken and studied in detail in consultation with the radiologist.

A total of 66 patients were available for the study. The age of patients varied from 18 to 79 years. Majority of cases are between the age of 30 and 50 years.

Males constituted 71% and females 29% giving a male-to-female ratio of 2.45:1.

Number of Patients				
Age Group	Male	Female	Total	Percentage
11-20	1	2	3	4.54
21-30	3	1	4	6.06
31-40	16	5	21	31.82
41-50	15	6	21	31.82
51-60	7	3	10	15.15
61-70	4	1	5	7.58
71-80	1	1	2	3.03
Total	47	19	66	100

Table 1. Age Wise Distribution of Patients

Clinical Type of Hansen’s Disease

Majority (30%) of the cases belonged to the borderline tuberculoid type.

	Number of Patients		Percentage	
	Male	Female	Total	
Indeterminate	Nil	Nil		
Tuberculoid	Nil	Nil		
Borderline tuberculoid	20	10	30	46
Borderline lepromatous	14	5	19	29
Lepromatous	7	2	9	14
Pure neuritic	6	2	8	11
Total	47	19	66	100

Table 2. Type of Hansen’s Disease

Delay in Starting Definitive Treatment

Out of the 66 patients, 21 gave a history of delay in starting definitive treatment after the appearance of signs/symptoms. The period of delay ranged from 2 months to 12 years. In 76% of cases, the reason for the delay was previous nondirective treatment. In 24%, the patient did not turn up, because the lesions were asymptomatic.

Regularity of Treatment for the Disease

70% of patients were regular in treatment and 30% were irregular in treatment.

Use of Protective Foot Wear

Most of the patients were having protective foot wear, but not regularly using it. The common complaints about the footwear was that it was heavy and inconvenient to use while at work or it was ill fitting and produce ulceration.

Practice of Other Precautionary Measures

92% of the patients were not practicing the preventive measures like controlled walking, daily inspection of hand and feet and application of emollients.

Distribution of Ulcer

The ulcers were bilateral in 20% and unilateral in 80% of cases.

Site of the Ulcer

21% of cases, the ulcer was over the big toe, 22% over the head of first metatarsal, 22% beneath the head of second, third and fourth metatarsals.

Site	Frequency	%
Big toe	16	21
Head of first metatarsal	17	22
Head of other metatarsals	17	22
Toes	9	12
Base of fifth metatarsal	6	8
Heel	11	17

Table 3. Site of Ulcer

Deformities

Different types of deformities observed are claw toes in 33%, footdrop with inversion in 11.4%, footdrop alone in 4% and flexion deformity of the big toe in 5%.

	No. of Patients	%
Claw toes	26	33
Foot drop + inversion	9	11.4
Foot drop	3	3.8
Flexion deformity of big toe	4	5

Table 4. Deformities

Bone Changes

The most common bone change observed was resorptive changes, which was present in 34% of patients, osteomyelitis in 24% and disorganisation of the arch of foot in 27% cases.

Bone Changes	No. of Patients	%
Osteomyelitis	16	24
Resorption of toes and metatarsals	23	3.34
Disorganisations of arches of foot	18	27
Fracture metatarsal with callus formation	3	4.5
Calcaneal spur	2	3

Table 5. Bone Changes

Pus Culture and Sensitivity Test

Bacterial culture yielded Staphylococcus aureus in 41.7%, combination of Staphylococcus and Streptococcus in 35.4% and Klebsiella and Pseudomonas in 1.26% each. No pathogen could be isolated from 20% of ulcers.

Bacteria Isolated	No. of Patients	%
Staphylococcus	33	41.77
Streptococcus + Staphylococcus	28	35.44
Klebsiella	1	1.26
Pseudomonas aeruginosa	1	1.26
No pathogen isolated	16	20.25

Table 6. Culture Report

Sensitivity of the Pathogen

49% of the staphylococci isolated were sensitive to penicillin. 46% were penicillin resistant of which 5% were also resistant to other antibiotics. Streptococci and other organisms isolated were sensitive to the commonly used antibiotics.

	%	
Staphylococci		
Sensitive to penicillin	30	49
Resistant to penicillin	28	46
Highly-resistant strain	3	5
Streptococci		
Sensitive to penicillin, erythromycin	28	100
Klebsiella		
Sensitive to penicillin, erythromycin, ampicillin	1	100
Pseudomonas		
Sensitive to gentamicin	1	100
Table 7. Culture Report		

DISCUSSION

Majority (68%) of patients were manual labourers. The increased incidence in this group was due to excessive trauma sustained to their feet during work. 90% of females were unemployed housewives who also had to do household work, which involved continuous trauma to hands and feet.

The delay in starting treatment in 21 patients might have probably lead to progression of the disease and damage to the nerves before starting treatment. This reflects the poor general awareness of patients. The use of appropriate protective footwear is considered the most vital factor in the prevention of ulceration in an insensitive foot. Most of the patients had protective footwear, but were not using regularly. The cosmetically unacceptable and the ill-fitting nature of the shoe were the reasons for not using it. This shows the necessity for providing cosmetically acceptable and properly fitting shoes without much delay.

92% of the patients were unaware of the precautionary measures to be undertaken like controlled walking, daily inspection of the feet and application of emollients. These aspects were probably not impressed upon them and also the majority of the patients were unable to understand the consequences. This points to the necessity of repeatedly instructing the patients to make them feel the importance of saving the feet.

Majority (58%) of them turned up only late with deep ulcers when it have involved deeper than the subcutaneous tissue and were totally ignorant of the sterile measures to be undertaken in the early stage when an ulcer develops.

The occurrence of the major proportion of ulcers in the forefoot is consistent with various studies.^{2,3,4} Out of the 11 heel ulcers, 5 were found at tile edge of tile heel, which had developed from fissures. This is due to the lack of foot care in giving proper attention to the daily soaking and oil application. In six cases, which had ulceration at the base of the fifth metatarsal, there was associated footdrop. Four patients presenting with ulcer of the big toe had flexion deformity of the big toe. Prompt and early correction of deformities would have prevented such ulcers.

The presence of osteomyelitis in 24% of cases show that it could have been cause for delay in healing and persistence of the ulcer. Nonspecific resorptive changes seen in 34% indicates recurrent trauma and inflammation on an insensitive foot. The disorganisation of arches seen in 27% might have led to altered weightbearing and perpetuation of the ulcer. Calcaneal spur was present in 18% of feet ulcers. Many studies suggest that calcaneal spur can increase the chance of heel ulceration.^{5,6,7} This is due to augmentation of the pressure at that site by the spur on prolonged standing.

The organisms isolated from the ulcers are Staphylococci, Streptococci, pseudomonas and Klebsiella.

SUMMARY AND CONCLUSION

As per the study, the important factors contributing to the development of plantar ulcers among leprosy patients were found to be as follows-

The delay in starting treatment was an important factor contributing to the progression of the disease and nerve damage. Physical labour was also found to be a predisposing factor as the major proportion of patients were manual labourers or those involved in some physical work. The practice of feet care was extremely poor among these patients. Patients were not using protective footwear regularly, since they found it as heavy and inconvenient, cosmetically unacceptable or ill fitting. Majority of the patients (92%) were unaware of the other precautionary measures to be undertaken in the care of an insensitive foot. Deformities like footdrop, claw foot and flexion deformity of the big toe was seen in 53% making the feet more susceptible to ulceration. Osteomyelitis was observed in 20% of the case, which was probably responsible for the chronicity of the ulcers. Calcaneal spur was a factor contributing to heel ulceration. The common infective agents isolated from the ulcer were staphylococci, streptococci and rarely Pseudomonas and Klebsiella. There was associated anaerobic infection in a majority of patients as it was evident from the foul-smelling discharge.

It is suggested that plantar ulcers in leprosy are preventable by appropriate intervention creating a general awareness of the disease and its early and proper treatment is important. Some form of occupational rehabilitation is necessary in appropriate cases involving physical labour. When an insensitive feet is detected, the protective footwear must be provided and it should be cosmetically acceptable and well fitting. Patients should be given adequate and repeated instruction about the precautionary measures to be undertaken in the care of the insensitive feet. Early correction of deformities like footdrop and claw toes is also important. Complications like osteomyelitis have to be properly treated by a prolonged course of antibiotics and surgical debridement if indicated. The occurrence of plantar ulcers and its complications are not inevitable sequelae of leprosy and are totally preventable if appropriate measures are undertaken at the earliest.

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