

# Bio-clinical Profile of Footwear Dermatitis

Praveen Kumar Rathore<sup>1</sup>, Varun Khullar<sup>2</sup>, Suhail Mukammil<sup>3</sup>

## ABSTRACT

**Introduction:** 'Footwear dermatitis' can be defined as a multitude of cutaneous changes on the feet caused by wearing of shoes, boots or sandals. This often occurs because the skin on the feet reacts to particular substances found in footwear, resulting in various clinical pattern of dermatitis depending upon the different demographic profile of patients. Study aimed to see the various clinical pattern of footwear dermatitis in relation to their demographic profile.

**Material and Methods:** This cross-sectional observational study was conducted in the Department of Dermatology, Venerology and Leprology, Rohilkhand Medical College, Bareilly, Uttar Pradesh between 1<sup>st</sup> August 2014 to 31<sup>st</sup> August 2015 after ethical clearance. Total 168 patients with cutaneous lesions clinically suggestive of foot dermatitis were registered in the outpatient door out of which 71 patients were enrolled for this study based on the exclusion and inclusion criteria chosen.

**Results:** Out of total 71 enrolled patients, 42 (69%) were male and 22 (31%) were female. 42 (59%) patients were in between the age group of 20-39 years. Occupationally, it was significantly observed in certain groups of male subjects such as farmers and factory workers accounting for 30.6%, 26.5% respectively. Among females, housewives and students were chiefly affected groups constituting 45.45% & 18.18% of total. Taking the predominantly involved sites into consideration, dorsal surface of foot was most common (32.93%), followed by dorsa of big toe (30.98%), plantar surface (15.49%) and others. Clinically, erythema (23.94 %) was most commonly seen manifestation in study group, followed by lichenification (16.9%), papulovesicular (12.67%), Cracking and Fissuring (12.67%) and other cutaneous changes.

**Conclusion:** This study found that foot dermatitis- a bilateral disorder were more common in male mostly involved dorsal surface of big toe and commonly presented with erythema.

**Keywords:** Bio-clinical, Footwear Dermatitis

## INTRODUCTION

Footwear dermatitis or shoe-contact dermatitis can be defined as skin manifestations on the feet caused by the wearing of shoes, boots or sandals. This often occurs because the skin on the feet reacts to particular antigenic substances found in footwear, leading to the CD4-T lymphocyte mediated type-4 hypersensitivity reaction eventually culminating in cutaneous inflammatory changes. Footwear dermatitis is relatively undiagnosed skin condition. Many other clinical conditions can also give rise to lower extremity dermatitis such as psoriasis, atopic dermatitis, cellulitis, chronic superficial folliculitis, nummular dermatitis, prurigo, dermatophytosis, insect bite, hypertrophic lichen planus that is why correct identification of this condition is necessary to avoid the misdiagnosis and further management of this condition. Patch test can diagnose and differentiate from other form of dermatitis but it is a time taken test and lead to various difficulties to the patient limiting its practical implication. Another limitation of Patch testing is its fluctuating "Positive predictive value" which is

mainly dependent on type of allergen used. So proper history and clinical examination is necessary for diagnosis. Taking all these points into consideration, this observational study was dedicated to describe bio - clinical profile of patients presenting with footwear dermatitis.

## MATERIAL AND METHODS

This cross-sectional observational study was carried out in the Department of Dermatology, Venerology and Leprology, Rohilkhand medical college, Bareilly, Uttar Pradesh between 1<sup>st</sup> August 2014 to 31<sup>st</sup> August 2015 after getting ethical clearance from IRB. Total 168 patients having cutaneous lesions clinically suggestive of foot dermatitis were registered in the outpatient door out of which 71 patients were enrolled for this study based on the exclusion and inclusion criteria chosen.

### Inclusion Criteria

1. Patient presenting with cutaneous lesions clinically suggestive of contact dermatitis on feet.
2. Patients giving consent for patch testing two or three times.
3. Patient should be living in or around Bareilly.
4. Patients must stop all the medicines two weeks prior to patch test.

### Exclusion Criteria

1. Patients with acute eczematous lesions.
2. Patients having foot dermatitis, suspected to be due to systemically administered agent.
3. Patients receiving systematic corticosteroids and/or another immunosuppressive drug.

### History and Examination

A detailed history of each patient was recorded in standard set of questionnaire recording presenting complaints and their duration, seasonal variation, medicaments used for pre-existing lesions, atopy in self or family members and history of allergy to food, drugs or air-borne agent. A detailed occupational history including the agents used in the work environment was also noted.

A complete clinical examination was done in all patients and the details about the sites of involvement, morphology of the clinical lesion were carefully noted down and their relevance to the complete history was assessed and evaluated for the probable contacts in the individual patients.

<sup>1</sup>Professor, <sup>2</sup>Junior Resident, 3rd year, <sup>3</sup>Junior Resident 2nd Year, Department of Dermatology and Venerology. Rohilkhand Medical College and Hospital, Bareilly, India

**Corresponding author:** Dr Varun Khullar, Room no 31, Intern and PG Boys Hostel, Rohilkhand Medical College and Hospital Campus, Bareilly, India

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## STATISTICAL ANALYSIS

Chi-square test and stratified analysis were used for bivariate analyses. A  $p$ -value  $< 0.05$  was considered to indicate statistical significance.

## RESULTS

A total 71 patients with eczematous lesions clinically suggestive of foot dermatitis were included in this study. Out of which 49 (69%) were male and 22 (31%) were female. 42 (59%) of subjects were in between age group of 20 to 39 years. In our study female were less commonly affected as opposed to male. In our study, most of the cases were from their third and fourth decade of age.

Table-1 shows distribution of subjects according to their occupation. A highly significant association was found between occupation and foot dermatitis. As most of the cases were farmer we can understand most of the time they work bare footed in hot and humid climate.

Table-2 shows details about first body part involved in foot wear dermatitis. Dorsal surface of foot is most common (32.93%), followed by dorsa of big toe (30.98%), Plantar surface (15.49%), heels (11.27%) and interdigitate area (due to slippers and sandals which are used in female frequently) 11.27%.

Table-3 shows that Erythema (23.94 %) is most commonly seen in study group, followed by lichenification (16.9%),

Occupation	Male N(%)	Female N (%)	Total N (%)
House Wife	0 (0)	10 (45.45)	10 (14.08)
Medical Nursing	7 (14.28)	0 (0)	7 (9.86)
Farmer	15 (30.61)	0 (0)	15 (21.13)
Student	8 (16.32)	4 (18.18)	12 (16.90)
Factory Worker	13 (26.53)	0 (0)	13 (18.3)
Clerical Work	3 (6.12)	3 (3.64)	6 (8.45)
Others	3 (6.12)	5 (22.73)	8 (11.27)
Chi square value = 42.7; P value=0.000			

**Table-1:** Occupational Pattern of Footwear Dermatitis

Site affected	Male N(%)	Female N(%)	Total N(%)
Dorsa of Big Toe	17 (34.69)	5 (22.73)	22 (30.98)
Dorsal Surface	14 (28.57)	9 (40.91)	23 (32.39)
Heels	6 (12.24)	2 (9.09)	8 (11.27)
Plantar Surface	9 (18.36)	2 (9.09)	11 (15.49)
Interdigitate Area	3 (6.12)	5 (22.73)	8 (11.27)

**Table-2:** Distribution of Footwear Dermatitis According to Body Part First Involved

Morphology	Male N (%)	Female N (%)	Total N (%)
Erythema	11 (22.45)	6 (27.27)	17 (23.94)
Papulovesicles	6 (12.24)	3 (13.64)	9 (12.67)
Oozing	6 (12.24)	2 (9.09)	8 (11.27)
Dry Scaling	4 (8.16)	1 (4.54)	5 (7.04)
Cracking and Fissuring	5 (10.20)	4 (18.18)	9 (12.67)
Ulceration	3 (6.12)	0 (0)	3 (4.23)
Lichenification	9 (18.36)	3 (13.64)	12 (16.9)
Hyper pigmentation	3 (6.12)	2 (9.09)	5 (7.04)
Depigmentation	2 (4.08)	1 (4.54)	3 (4.23)

**Table-3:** Distribution of Footwear Dermatitis According to Morphology of Lesions

papulovesicular (12.67%), Cracking and Fissuring (12.67%), Oozing (11.27%), Dry scaling (7.04%), Hyper pigmentation (7.04%), Depigmentation (4.23%) and Ulceration (4.23%).

## DISCUSSION

Contact dermatitis is a common dermatosis accounting for nearly 10-15% of all patients attending dermatology OPD. Its prevalence is high in tropical country like India due to many contributing factors such as high temperature, humidity, probable lack of strict quality control and habitual avoidance of socks leading to direct contact between skin and footwear. Now a days, a decrease in its incidence has been observed in paediatric and geriatric age group and adults of third and fourth decade are more prone to such dermatitis. Foot dermatitis is seen both in male and female however minor differences have been noted between two sexes due to environmental variation including climate, occupational profile and types of foot wears being in use. The dorsa of feet and toe were the commonest site of involvement, probably due to larger surface area, thinner stratum corneum and maintenance of prolonged intimate contact with footwear uppers. Interdigital involvement among study group was possibly due to the use of chappals and sandals particularly by females. As most of the cases were farmers and factory workers suggesting the fact that most of the time they work bare footed in hot and humid climate. Wearing shoes for long duration is also a major preceding aetiological factor causing such dermatitis in factory workers. On comparing our current observation with previous studies, it has to be mentioned that according to the study conducted by Chowdhuri et al., fifth decade of age group were predominantly affected and most of them were housewives. Other studies carried out by Priya et al, Saha et al and Handa et al also found that dorsal surface of feet were the most commonly affected site supporting the results of our study.<sup>2-5</sup> For clinical pattern, Priya et al found that scaly plaque was the most common morphological pattern unlike the findings of our study.<sup>2</sup>

## CONCLUSION

This study found that foot dermatitis with bilateral involvement of feet, was more common in male and especially those who were in third and fourth decade of age, mostly involved dorsal surface of big toe and commonly presented with erythema.

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