Original Article

Foot Eczema: Clinical Findings, Footwear Preferences, And the Impact of Contact Allergens in A Cross-Sectional Study

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Abstract

Background: Foot eczema is a common dermatological condition that causes discomfort and impacts quality of life. Its clinical presentation and the role of allergens remain underexplored, particularly in relation to footwear and household factors. THE Objective is to study the morphological patterns, common allergens, and the impact of footwear and other household Factors on foot eczema patients attending a dermatology clinic. **Material and Methods:** A cross-sectional study was conducted at Shri Mahant Indresh Hospital, Dehradun, involving patch testing and clinical assessments of foot eczema in 70 patients. **Results:** The dorsum of the foot was the most common site for lesions (78.6%). Detergents (30%). and footwear (17.1%). There were significant aggravating factors. Hyperkeratotic eczema was most prevalent (48.6%). **Conclusion:** Foot eczema is primarily influenced by household and occupational factors. Patch testing helps identify allergens, and hyperkeratotic eczema is the predominant morphological pattern in affected individuals.

Keywords: Foot eczema, patch testing, allergens, household exposure, hyperkeratotic eczema, footwear, dermatology, clinical findings, morphology.

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Introduction

Foot eczema is a common dermatological condition that primarily affects the feet, causing significant discomfort and impairment of daily activities. The condition is categorised into several types, with allergic contact dermatitis (ACD). being the most prevalent form. ACD results from exposure to allergens in materials such as rubber, leather, and other footwear components.[1] Epidemiologically, foot eczema often coexists with hand eczema, particularly in patients with a history of atopic dermatitis.[2] The disease manifests with symptoms like itching, scaling, and erythema, significantly impacting the quality of life of affected individuals.[3]

Globally, the prevalence of foot eczema varies, but studies indicate a rising burden due to increased exposure to Allergens in occupational and everyday settings. In India, foot eczema is a concern, especially among individuals working in environments that require protective footwear.[4] Studies show that the majority of patients experience allergic reactions to specific footwear allergens such as mercaptobenzothiazole, potassium dichromate, and thiuram mix.[5] Despite the growing prevalence, there is a lack of comprehensive data and diagnostic clarity on the exact allergen profiles in Indian populations, which poses challenges in diagnosis and management.

Foot eczema is often linked to occupational factors, such as prolonged use of safety boots and exposure to workplace irritants.[6] However, non-occupational factors, including atopy and hyperhidrosis, are also significant contributors to the condition's development. Despite advances in diagnostic tools such as patch testing, which are critical for identifying causative allergens, there remains a gap in their use for footwear-related allergies, particularly in resource-limited settings.

Given the rising prevalence and clinical implications, this study was planned to understand better the allergens causing foot eczema in a Local Population. Patch testing remains a pivotal diagnostic tool, but its wider application in identifying footwear-related allergens can enhance the management of the condition.[5]

Materials and Methods

In the Department of Dermatology, Venereology, and Leprosy at Shri Mahant Indresh Hospital, Dehradun, the current cross-sectional investigation was conducted over 18 months. The study included all patients diagnosed with foot dermatitis who visited the outpatient department of Shri Mahant Indresh Hospital, Dehradun, and met the inclusion criteria during the

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study period. The study included patients who were clinically diagnosed with foot dermatitis, aged 18 or older, and willing to provide written informed consent. Patients who were unwilling to provide informed consent, those taking systemic corticosteroids, immunosuppressants, or PUVA therapy for at least 2 weeks before the patch test, and pregnant or lactating females were all excluded from the study. Using the Statistical Package for the Social Sciences (SPSS), the results were analysed and interpreted.

Results

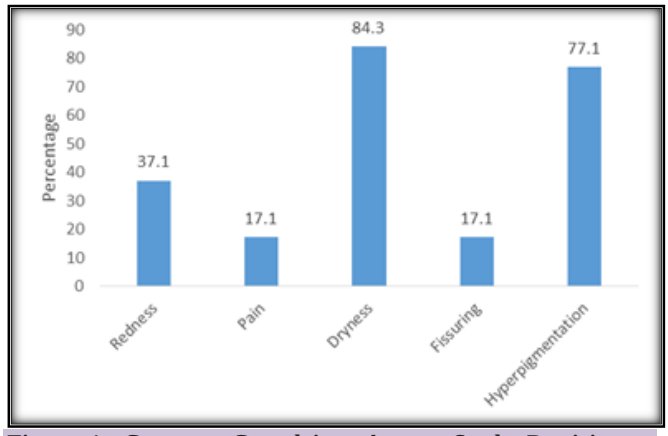

Figure 1: Common Complaints Among Study Participants with Foot Eczema

The study showed that foot eczema is most prevalent in the 36-45 years age group (24 participants), with notable occurrences also in the 26-35 years (11 participants). and 46-55 years (13 participants). age ranges. The condition is slightly more common in males (54.3%). compared to females (45.7%). Occupation-wise, housewives (37.1%). was the most affected, followed by those in service (18.6%). and business (10%). suggesting that domestic and sedentary occupations may contribute to higher incidence rates. The onset of foot eczema is most commonly reported in the 21-30 years age group (20 participants), with the 31-40 years group also showing a significant frequency (21 participants). This highlights that foot eczema typically develops in early to middle adulthood, with fewer cases reported after age 50.

[Figure 1] reveals that dryness (84.3%). and hyperpigmentation (77.1%). These are the most common complaints among participants with foot eczema. Redness and fissuring both affect 37.1% and 17.1% of participants, respectively, while pain is less frequent, reported by 17.1%. This indicates that dryness and hyperpigmentation are the predominant symptoms of foot eczema.

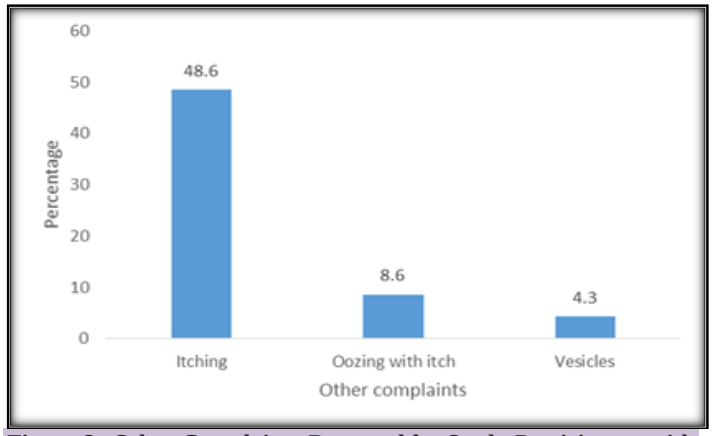

Figure 2: Other Complaints Reported by Study Participants with Foot Eczema

The table shows that itching was the most common other complaint, reported by 48.6% of participants, followed by oozing with itch (8.6%). and vesicles (4.3%). This highlights that itching is a significant symptom of foot eczema, while oozing and vesicles are less frequent.

Table 1: Site of Initial Lesion in Study Participants with Foot Eczema

Site of initial lesion	Count (n)	Percentage (%)
Dorsum of foot	55	78.6 %
Plantar aspect of foot	10	14.3 %
Forefoot	7	10.0 %
Heel	6	8.6 %
Instep	8	11.4 %

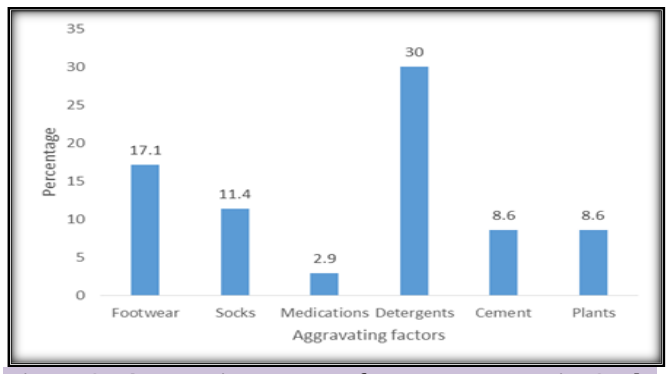

Figure 3: Aggravating Factors for Foot Eczema in Study Participants.

[Table 1] shows that the dorsum of the foot is the most common site for the initial lesion, affecting 78.6% of participants. Other sites include the plantar aspect of the foot (14.3%), the forefoot (10%), the instep (11.4%), and the heel (8.6%). This indicates that the top of the foot is the primary location for foot eczema lesions.

[Figure 3] indicates that detergents are the most significant aggravating factor for foot eczema, reported by 30% of participants, followed by footwear (17.1%). and socks (11.4%). Other factors include cement and plants (8.6% each), with medications being the least reported aggravating factor (2.9%). This suggests that common household items and footwear play a significant role in exacerbating foot eczema.

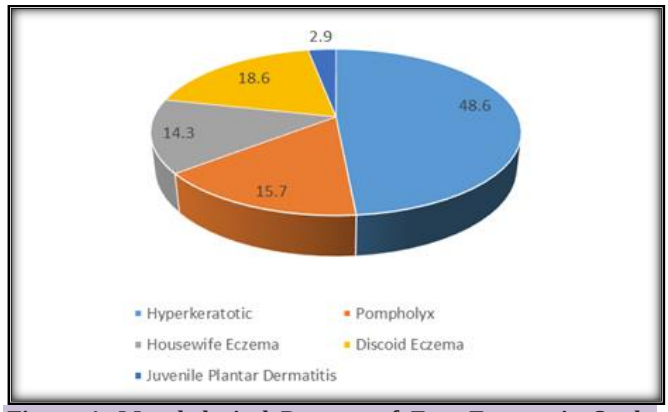

Figure 4: Morphological Patterns of Foot Eczema in Study Participants

[Figure 4] shows that hyperkeratotic eczema is the most common morphological pattern, affecting 48.6% of participants, followed by discoid eczema (18.6%). and pompholyx (15.7%). Housewife eczema is seen in 14.3% of participants, while juvenile plantar dermatosis is the least common, affecting 2.9%. This highlights that hyperkeratotic eczema is the predominant type of foot eczema.

Discussion

The results of this study reveal that foot eczema is most prevalent in the 36-45 years age group, with males (54.3%). slightly more affected than females (45.7%). Housewives (37.1%). are the most impacted, followed by individuals in service (18.6%). and business (10%). This aligns with previous studies, such as Sahu S et al (2022).[2] where similar age groups and occupations showed a higher incidence of foot eczema, particularly in adults aged 30-40 years. Dryness (84.3%). and hyperpigmentation (77.1%). were the predominant symptoms, consistent with findings from Mohanty S et al (2020).[3] who also identified these as major clinical features of foot dermatitis. Itching (48.6%). was the most common other complaint, followed by oozing and vesicles, which were less frequent, echoing observations in studies by Thyvalappil A et al (2020).[5] The study's findings, however, show a relatively lower incidence of vesicles compared to Brans R et al (2015).[6] which reported higher occurrences of vesicular lesions in foot eczema cases. Overall, this study highlights key similarities with existing literature but provides unique insights into the prevalence of hyperpigmentation and dryness as the most frequent symptoms of foot eczema in the study population. The results from this study indicate that the dorsum of the foot is the most common site for initial lesions, affecting 78.6% of participants, which aligns with findings by Mohanty S et al (2020), where the dorsum was also the most frequently affected site. [Figure 3] highlights detergents as the primary aggravating factor (30%), followed by footwear (17.1%). and socks (11.4%), similar to observations in Sahu S et al (2022). [Figure 4] shows hyperkeratotic eczema as the most common morphological pattern (48.6%), consistent with findings by Thyvalappil A et al (2020).[5] However, the relatively lower occurrence of juvenile plantar dermatitis (2.9%). In this study, contrasts with Brans R et al. (2015).[6] where it was more prevalent, overall, these findings highlight the role of common household and footwear factors in exacerbating foot eczema.

Conclusion

We concluded that foot eczema is a multifactorial condition strongly influenced by everyday exposures, particularly detergents and footwear materials. The dorsum of the foot was identified as the most commonly affected site, with hyperkeratotic eczema emerging as the predominant morphological type. These findings highlight the chronic, recurrent nature of the disease and its close link with occupational and lifestyle factors. The study underscores the pivotal role of patch testing in accurately identifying causative allergens, enabling tailored and effective management plans. By recognising the impact of common household and environmental triggers, this study emphasises the importance of preventive care, patient education, and early intervention. Strengthening awareness about allergen avoidance and adopting appropriate footwear and skin-care practices can significantly improve clinical outcomes and enhance the quality of life in individuals affected by foot eczema.

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Conflicts of interest

There are no conflicts of interest.

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