

PATCH TESTING AS A DIAGNOSTIC TOOL IN ISOLATED LEG AND/OR FOOT ECZEMA

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ABSTRACT

Background: Isolated leg and/or foot eczema is a chronic dermatological condition with multifactorial etiology, including allergic contact dermatitis. The aim is to evaluate clinical patterns and the role of patch testing in isolated leg and/or foot eczema. **Materials and Methods:** Fifty patients were evaluated clinically. VAS itching and sleep scores were recorded. Patch testing was performed using standard series. **Results:** Females constituted 56%. Most patients were aged 16–30 years (58%). Foot involvement was seen in 88%. Frictional eczema (18%) was the most common diagnosis. Patch test positivity was seen in 38%, with Parthenium (20%) being the most common allergen. **Conclusion:** Patch testing is useful in identifying causative allergens in leg and foot eczema.

INTRODUCTION

Eczema is a clinical and histological pattern of inflammation characterized by itching, erythema, vesiculation, and scaling.^[1] It commonly affects the legs and feet, where it tends to be chronic and recurrent.^[2]

Isolated leg and foot eczema significantly affects quality of life due to pain, fissuring, and difficulty in walking. Contact sensitivity plays a major etiological role.^[3]

Footwear dermatitis is common in India due to exposure to rubber, leather, adhesives, and dyes.^[4,5] Patch testing is the gold standard for diagnosing allergic contact dermatitis.^[6]

This study was conducted to evaluate clinical patterns and the role of patch testing.

MATERIALS AND METHODS

This hospital-based, cross-sectional observational study was conducted in the Department of Dermatology at a tertiary care teaching hospital over a period of one year. Fifty consecutive patients aged ≥16 years presenting with isolated eczema involving the leg and/or foot were enrolled after obtaining written informed consent. Institutional Ethics Committee approval was obtained prior to commencement of the study.

Patients with generalized eczema, active dermatophytosis, pregnancy, lactation, immunosuppressive disorders, or those receiving

systemic corticosteroids, immunosuppressants, or phototherapy within the preceding four weeks were excluded. Patients with acute, extensively inflamed eczema precluding patch testing were also excluded.

A detailed history was recorded, including age, sex, occupation, duration of disease, site of involvement, aggravating factors, history of atopy, footwear use, occupational exposure, topical medication use, and associated symptoms. Complete dermatological examination was performed, and the clinical diagnosis was documented. Disease severity was assessed using the Eczema Area and Severity Index (EASI). Pruritus intensity was evaluated using a 10-cm Visual Analogue Scale (VAS), while sleep disturbance due to itching was assessed using a similar VAS.

Patch testing was performed after the acute phase had subsided using the Indian Standard Series of allergens approved by the Contact and Occupational Dermatoses Forum of India (CODFI). Allergens were applied on the upper back using aluminium Finn chambers mounted on hypoallergenic adhesive tape. Patients were instructed to avoid wetting the test area, excessive sweating, and topical or systemic corticosteroids during the testing period. Patch test readings were taken at 48 hours (Day 2) and 96 hours (Day 4) and interpreted according to the International Contact Dermatitis Research Group (ICDRG) criteria as negative, doubtful, weak positive (+), strong positive (++), or extreme positive (+++). Only

clinically relevant positive reactions were considered for analysis.

The primary outcome measure was the proportion of patients with positive patch test reactions and identification of the common allergens. Secondary outcomes included demographic characteristics, clinical patterns, site distribution, disease severity, and correlation between EASI score, pruritus, and sleep disturbance.

RESULTS

Demographic Profile

Females (56%) slightly outnumbered males (44%), possibly due to increased exposure to household irritants.

Maximum patients belonged to 16–30 years (58%), likely due to higher exposure to footwear and environmental allergens.

Rural patients (58%) were slightly more affected, possibly due to environmental exposure such as Parthenium.

Table 1: Demographic Profile

Variable	Number	Percentage
Female	28	56%
Male	22	44%

Clinical Characteristics

Mean duration was 2.09 years, indicating chronic disease.

Dryness (92%) and itching (96%) were most common due to barrier dysfunction.

Table 2: Presenting Symptoms

Symptom	Number	Percentage
Dryness	46	92%
Itching	48	96%
Redness	34	68%
Pain	35	70%
Swelling	20	40%

Site of Involvement

Foot involvement (88%) was most common due to occlusion, friction, and sweat.

Table 3: Site Distribution

Site	Number	Percentage
Only Foot	32	64%
Only Leg	6	12%
Both	12	24%

Clinical Diagnosis

Frictional eczema (18%) was most common due to pressure and friction.

Table 4: Clinical Diagnosis

Diagnosis	Number	Percentage
Frictional eczema	9	18%
ACD to footwear	12	24%
Non-specific dermatitis	8	16%
Plantar psoriasis	7	14%
Stasis dermatitis	5	10%
LSC	6	12%
Vesicular eczema	1	2%
Discoid eczema	2	4%

Patch Test Results

Patch test positivity: 38%

Multiple allergens seen due to repeated exposures.

Parthenium (20%) most common due to environmental exposure.

Table 5: Patch Test Positivity

Result	Number	Percentage
Positive	19	38%
Negative	31	62%

Table 6: Common Allergens

Allergen	Percentage
Parthenium	20%
Nickel sulphate	10%
Thiuram mix	4%

Correlation

Significant correlation found between:
Itching & sleep

DISCUSSION

The present study highlights the clinical spectrum and etiological factors of isolated leg and/or foot eczema in a North Indian population. A slight female predominance was observed, which may be attributed to increased exposure to household irritants such as detergents, soaps, and prolonged wet work. These factors can impair the epidermal barrier, facilitating allergen penetration and increasing susceptibility to eczematous dermatitis. This finding is consistent with studies by Chougule et al., which also reported a higher prevalence among females, although other studies on footwear dermatitis have shown male predominance, likely reflecting occupational differences and footwear usage patterns.^[7,8]

The majority of patients belonged to the 16–30 years age group, indicating that young adults are more frequently affected. This may be explained by greater mobility, increased use of occlusive and fashion footwear, and higher exposure to environmental allergens. The chronicity of the disease, with a mean duration of over three years, underscores the relapsing nature of eczema and the difficulty in identifying and avoiding causative factors, especially in the absence of patch testing.

Foot involvement was seen in the vast majority of patients, reinforcing the importance of local factors such as occlusion, sweating, friction, and prolonged contact with footwear materials. These conditions enhance percutaneous absorption of allergens and predispose to both irritant and allergic contact dermatitis. Forefoot eczema emerged as the most common clinical pattern, likely due to repeated mechanical stress at weight-bearing areas, combined with exposure to allergens present in footwear. This contrasts with some earlier studies where lichen simplex chronicus was more common, suggesting regional and environmental variations in disease patterns.^[7]

Patch test positivity was observed in 38% of patients, indicating that allergic contact dermatitis contributes significantly to the pathogenesis of isolated leg and foot eczema. The lower positivity rate compared to studies such as Suhail et al. may be due to the broader inclusion criteria in the present study, which included all cases of isolated eczema rather than only suspected allergic contact dermatitis.^[8] Notably, a substantial proportion of patients showed sensitivity to multiple allergens, reflecting cumulative exposure over time.^[9]

Parthenium was the most common allergen identified, which is in line with previous Indian studies and reflects the widespread presence of this plant in the environment, particularly in rural areas. Airborne contact and direct exposure during outdoor activities may explain its role even in foot eczema. Nickel sulphate and thiuram mix were other important allergens, highlighting the role of metallic components and rubber chemicals in footwear. These findings emphasize that both environmental and footwear-related allergens play a crucial role in disease causation.^[10]

A significant correlation was observed between disease severity (EASI score), itching, and sleep disturbance, indicating that even localized eczema can substantially impact quality of life. Pruritus, in particular, appears to be a key mediator of sleep disturbance, reinforcing the need for effective symptom control.^[11]

Overall, the study underscores the importance of a comprehensive approach that includes clinical evaluation and patch testing to identify etiological factors, prevent chronicity, and guide targeted management.^[12]

CONCLUSION

In conclusion, isolated leg and foot eczema is a common, chronic dermatological condition that predominantly affects young adults and most frequently involves the foot. Forefoot eczema is the most common clinical presentation, likely due to the combined effects of mechanical stress and exposure to footwear-related allergens. Patch testing plays a pivotal role in identifying causative allergens, with positive results observed in approximately one-third of patients in this study. Environmental allergens such as Parthenium and footwear-related allergens including rubber chemicals and metals are significant contributors in this population. Early identification of these allergens through patch testing can facilitate targeted avoidance strategies, reduce disease chronicity, and improve patient outcomes. Therefore, patch testing should be considered an essential component in the evaluation of patients with chronic or recalcitrant leg and foot eczema.

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