

## Comparative Analysis of Epidemiological Data as Well as Quality of Life in Patients having Hand Eczema vis-à-vis Foot Eczema

### Abstract

**Context:** Eczema of hand or foot though not life-threatening, not only impacts daily activities and work productivity adversely, but also impairs interpersonal relationships. **Materials and Methods:** Cross-sectional study of 100 outpatients of hand and foot eczema at a tertiary care teaching institute. Epidemiological data was collated and quality of life (QoL) evaluated by dermatology life quality index (DLQI) score. **Results:** Forty seven had hand eczema, 45; foot eczema and 8; both. Peak incidence of hand eczema (38.2%) was in fourth decade and foot eczema (33.3%), fifth decade. Hand eczema was more frequent in females (32; 68%) and foot eczema in males (32; 71.1%). Hand eczema was more common among housewives (14; 29.7%) and foot eczema among manual labourers (26; 57.7%). A persistent course was seen in foot (44; 83%) whereas recurrent course in hand eczema (21; 38.1%). Aggravation on contact with irritants/allergens was associated more with hand (32; 58.1%) than with foot eczema (18; 33.9%). Association with atopy was not significant. Substance abuse was associated more with foot eczema (25; 47.1%). Impairment in QoL was significantly higher in hand eczema (mean DLQI, 16.33) as compared to foot eczema (12.83). **Conclusion:** Hand eczema prevalent among females showed a high rate of recurrence whereas foot eczema in males, has a persistent course. Atopy is not significantly associated. The impairment in QoL is much greater in hand eczema as compared to foot eczema. The studies on comparative analysis of hand vis-à-vis foot eczema do not appear to exist in literature whereas studies of QoL impairment on hand eczema are abound.

**Keywords:** Dermatology life quality index, domains, hand and foot eczema

### Introduction

Hand eczema has an estimated lifetime risk of 2–10% and accounts for 9–35% of occupational diseases thereby constituting a major socioeconomic burden.<sup>[1]</sup> It is more common in females and is associated with atopy and household/occupational exposure to irritants/sensitisers.<sup>[2,3]</sup> Hands being cosmetically and occupationally important, eczema of the hands is associated with significant impairment in dermatology life quality index (DLQI).<sup>[3]</sup>

Due to a lack of data on the prevalence of foot eczema, its socioeconomic impact is largely unknown. Foot eczema is more common in males and is associated with smoking, atopy, hyperhidrosis and occupations such as construction and metal industries in which safety shoes/boots are mandatory.<sup>[2]</sup> Recalcitrant foot eczema with painful fissures and secondary infection can be disabling.<sup>[4]</sup> The clinical patterns of foot

eczema include lichen simplex chronicus, discoid eczema, allergic contact dermatitis and stasis dermatitis.<sup>[5]</sup>

The complex relationship that exists between the personality and psychosocial functioning may not only cause considerable impairment in quality of life (QoL) but may even lead to suicidal ideation in patients with eczema. There is evidence that these patients feel that their physicians trivialise their condition, underestimate its impact and fail to adequately appreciate its psychological aspects.<sup>[6]</sup> Therefore, in addition to assessing the clinical severity of eczema it is becoming increasingly important to assess the psychosocial morbidity by the use of standardised validated QoL measures in routine clinical practice, thus moving from a physician-centred towards a patient-centred approach.

A review of literature reveals that there is a lack of data on the prevalence of foot

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eczema *per se* as an occupational dermatosis.<sup>[2]</sup> Moreover, no previous studies have evaluated the impairment in QoL using DLQI scores in foot eczema. We have carried out a comparative study on the epidemiological aspects and the impairment in QoL in hand eczema as well as foot eczema.

## Materials and Methods

One hundred consecutive patients of hand/foot eczema attending the dermatology clinics in a tertiary care teaching institute in southern India were enrolled in this observational cross-sectional questionnaire based study spanning 24 months. Approval from the institutional ethics committee was taken and written informed consent from patients or guardians obtained. Eczema confined to the hands or feet with minimal involvement of adjacent areas has been termed hand eczema and foot eczema. Consecutive patients aged 16 years or above with a clinical diagnosis of hand/foot eczema were included in the study. Patients with dermatophyte or candidal infections diagnosed clinically or by positive skin scraping for fungus on potassium hydroxide preparation were excluded. Those with palmoplantar psoriasis, psoriatic lesions elsewhere and/or psoriatic nail involvement were also excluded. History of exposure to contact irritants and sensitizers, aggravating factors, substance abuse and personal and family history of atopy was taken in all cases. After recording epidemiological details, each patient was asked to fill in the validated Hindi or Marathi version of the 10-item DLQI questionnaire. The six domains of DLQI include symptoms and feelings (questions 1 and 2); daily activities (questions 3 and 4); leisure work (questions 5 and 6); work and school (question 7); personal relationships (questions 8 and 9) and treatment (question 10). Since each response is scored on a four point scale (0 = not at all; 1 = a little; 2 = a lot and 3 = very much) the total score may range from 0 (no impact) to 30 (maximum impact).<sup>[7]</sup> The DLQI scores may be grouped into five bands: 21-30: extremely large effect; 11-20: very large effect; 6-10: moderate effect; 2-5: small effect and 0-1: no effect on patient's life.<sup>[8]</sup>

Quantitative variables were described using percentages, ranges, means and standard deviations for statistical analysis. Student's independent *t*-test, analysis of variance test and Spearman's correlation analysis were performed using the Statistical Package for the Social Sciences, SPSS version 20 (SPSS Inc., Chicago, IL, USA) as appropriate. A two-tailed probability value of 0.05 or less was considered significant.

## Results

### Epidemiological aspects

Out of 100 patients enrolled in the study, 47 had hand eczema, 45 had foot eczema and 8 had concomitant hand and foot eczema. Their age ranged from 17 to 70 years, the peak incidence being in the fourth decade in hand eczema, fifth decade in foot eczema and sixth decade in concurrent hand and foot eczema. The majority of hand eczema (32; 68%) patients were female, foot eczema (32; 71.1%) patients were male and concurrent hand and foot eczema (6; 75%) patients were male. The duration of illness ranged from 1 to 6 months in the majority of hand and foot eczema cases and more than 12 months in the majority of concurrent hand and foot eczema cases [Table 1].

The occupational profile included professional workers, housewives, housekeepers, skilled workers, manual labourers and farmers. Professional workers included bank managers, engineers and advocates. Housewives were married women whose main occupation was caring for their families and doing housework while housekeepers were those who were employed for carrying out housework and domestic tasks. Skilled workers included drivers, mechanics and carpenters while manual labourers were unskilled workers such as those working at construction sites [Table 2].

A recurrent course was significantly associated with hand eczema in 21 (38.1%) and a persistent course with foot eczema in 44 (83%) cases (*P* value, 0.014). History

**Table 1: Comparison of sample characteristics in hand, foot and concurrent hand and foot eczema**

Characteristics	Hand eczema	Foot eczema	Concurrent hand and foot	<i>P</i>
Age				
<30	15 (31.9%)	7 (15.5%)	2 (25%)	0.068
31-40	18 (38.2%)	11 (24.4%)	1 (12.5%)	
41-50	10 (21.2%)	15 (33.3%)	2 (25%)	
>51	4 (8.5%)	12 (26.6%)	3 (37.5%)	
Sex				
Male	15 (31.9%)	32 (71.1%)	6 (75%)	0.0001
Female	32 (68.1%)	13 (28.9%)	2 (25%)	
Duration (months)				
<1	8 (17%)	3 (6.66%)	1 (12.5%)	0.029
1-6	31 (65.9%)	21 (46.6%)	2 (25%)	
7-12	3 (6.38%)	8 (17.7%)	1 (12.5%)	
>12	5 (10.6%)	13 (28.8%)	4 (50%)	

of household or occupational contact with irritants and allergens was more significantly associated with hand eczema in 32 (58.1%) patients as compared to foot eczema in 18 (33.9%) patients ( $P$  value, 0.012). Significant improvement on being away from work or not being in contact with irritants/allergens was reported by 18 (32.7%) hand eczema patients as compared to 7 (13.2%) foot eczema patients ( $P$  value, 0.016). Aggravation in winters was reported by only 2 (3.63%) patients of hand eczema and only 1 (1.88%) patient of foot eczema. Personal or family history of atopy was elicited in 7 (12.7%) patients of hand eczema and 3 (5.6%) patients of foot eczema. Substance abuse including smoking was significantly associated with foot eczema in 25 (47.1%) patients as compared to hand eczema in 10 (18.1%) patients ( $P$  value 0.001) [Table 3].

### Dermatology life quality index

The mean DLQI score in hand eczema ( $16.33 \pm 6.44$ ) was significantly higher than the score in foot eczema ( $12.83 \pm 6.35$ ) with  $P$  value of 0.005 [Table 4].

The DLQI score bands of extremely large effect (score 21–30); very large effect (score 11–20); moderate effect (score 6–10) and small effect (score 2–5) on QoL in hand eczema as compared to foot eczema are given in Table 5.

The highest score out of the six domains of DLQI in hand eczema ( $4.35 + 1.265$ ) and foot eczema ( $3.79 + 1.321$ ) was for domain 1 (symptoms and feelings) while the lowest score in hand eczema ( $1.38 + 0.952$ ) and foot eczema ( $0.92 + 0.874$ ) was for domain 6 (treatment). The scores for all the domains of DLQI were significantly higher in hand as compared to foot eczema.

### Discussion

The frequency of hand eczema including concomitant hand and foot eczema diagnosed clinically in 55 out of 100 consecutive patients as compared to 53 patients of foot eczema including concomitant hand and foot eczema in our study indicates that the prevalence of foot eczema may be as high as that of hand eczema.

The highest frequency of hand eczema was in the fourth decade of life as compared to that of foot eczema in the fifth decade of life in the present study. Previous studies have reported the highest frequency of hand eczema in the 21–40 years age group and foot eczema in the 31–45 years age group.<sup>[9,10]</sup>

The female preponderance in hand eczema in our study with 32 (68.1%) patients being female is comparable to a study carried out in Vellore, India in which 24 (52.2%) patients were female.<sup>[11]</sup> The male preponderance in foot eczema in the present study with 32 (71.1%) patients being male may be attributed to the greater number of men than women wearing safety shoes or boots in the workplace.<sup>[2]</sup>

**Table 2: Comparison of the occupational profile in hand, foot, and concurrent hand and foot eczema**

Occupation	Eczema			Total
	Foot	Hand	Both	
Professional	7 (15.5%)	4 (8.5%)	2 (25%)	13
Skilled worker	3 (6.6%)	8 (17%)	2 (25%)	13
Housewife	5 (11.1%)	14 (29.7%)	1 (12.5%)	20
Housekeeper	1 (2.2%)	10 (21.2%)	0	11
Labourer	26 (57.7%)	8 (17%)	2 (25%)	36
Farmer	1 (2.2%)	1 (2.1%)	1 (12.5%)	3
Student	2 (4.4%)	0	0	2
Unemployed	0	2 (4.2%)	0	2
Total	45	47	8	100

**Table 3: Comparison of course and aggravating factors in hand and foot eczema**

	Hand eczema	Foot eczema	$P$
Course			
Persistent	34 (61.8%)	44 (83%)	0.014
Recurrent	21 (38.1%)	9 (17%)	
Contact with irritants/allergens	32 (58.1%)	18 (33.9%)	0.012
Improvement on being away from work	18 (32.7%)	7 (13.2%)	0.016
Seasonal variation	2 (3.63%)	1 (1.88%)	0.58
Atopy	7 (12.7%)	3 (5.66%)	0.21
Substance abuse	10 (18.1%)	25 (47.1%)	0.001

**Table 4: The mean DLQI score in hand eczema as compared to foot eczema**

Parameter	Foot eczema		Hand eczema		MW test Z	$P$
	Mean	SD	Mean	SD		
DLQI score	12.83	6.35	16.33	6.44	2.84	0.005

**Table 5: DLQI score bands in hand eczema as compared to foot eczema**

DLQI score band	Hand eczema (%)	Foot eczema (%)
0-1	0	0
2-5	4 (7.3)	8 (15.1)
6-10	6 (10.9)	14 (26.4)
11-20	28 (50.9)	25 (47.2)
21-30	17 (30.9)	6 (11.3)
Total	55 (100)	53 (100)

Sweating may be aggravated due to occlusion by footwear thereby predisposing to foot eczema.

In our study a recurrent course was more significantly associated with hand eczema in 21 (38.1%) patients than with foot eczema while a persistent course was more significantly associated with foot eczema in 44 (83%) patients than with hand eczema.

A history of contact with household/occupational contact irritants/allergens was more significantly associated with

hand eczema in 32 (58.1%) patients as compared to foot eczema in 18 (33.9%) patients in the present study. There was significant improvement on being away from work in 18 (32.7%) patients of hand eczema as compared to 7 (13.2%) patients of foot eczema in our study. This may be attributed to the fact that hands are more frequently exposed to contact irritants including soaps and detergents as well as various occupational contact allergens.<sup>[5,9-12]</sup>

Substance abuse particularly smoking was more significantly associated with foot eczema in 25 (47%) patients as compared to hand eczema in only 10 (18%) patients in our study. This is consistent with a previous study reporting the association between foot eczema and tobacco smoking.<sup>[2]</sup>

An atopic diathesis in 7 (12.7%) patients of hand eczema as compared to 3 (5.6%) patients of foot eczema in the present study is not statistically significant. Our report is consistent with a study on hand eczema in an ethnic Kashmiri population in which an atopic diathesis was noted in only 11 (1.4%) patients.<sup>[13]</sup> However, our study is at variance with western studies including a study on hand eczema from Portland, United States reporting an atopic diathesis in 58% of patients.<sup>[14]</sup>

Housewives (14; 29.7%) and housekeepers (10; 21.2%) constituted a large proportion of hand eczema cases in our study whereas labourers (26; 57.7%) accounted for a majority of foot eczema cases. This is consistent with household or occupational exposure to contact irritants and allergens.<sup>[5,9-12]</sup>

The mean DLQI score of (16.33 ± 6.44) in hand eczema in our study is at variance with and considerably higher than the scores reported previously in various studies carried out in Amritsar, India (6.22 ± 5.42), Vellore, India (9.54 ± 5.62), Multicentre, Europe 8.0 (4.0–13.0), Multicentre, Germany (11.1 ± 6.5) and Multicentre, Europe (9.7 ± 5.8) respectively.<sup>[3,11,15-17]</sup> Further studies are required to validate the higher DLQI scores in hand eczema in our study.

In the present study the mean DLQI score of (12.83 ± 6.35) in foot eczema is significantly lower than the score of (16.33 ± 6.44) in hand eczema. There is no previous report on impairment in QoL in foot eczema by evaluation of DLQI scores.

The limitations of our study include the small sample size, the cross-sectional study design and the lack of correlation between the severity of eczema and QoL.

To conclude, the prevalence of occupational foot eczema may be as high as that of hand eczema but this requires validation by further studies. The male predominance in foot eczema may be attributed to the greater number of men than women wearing protective shoes or boots to the workplace. Tobacco smoking is significantly associated

with foot eczema. Atopy is not significantly associated either with hand eczema or foot eczema. The impairment in QoL is much greater in hand eczema as compared to foot eczema. Hands being important not only for carrying out daily activities but also for social interaction, any eczema of the hands that is visible to others has a major impact on the physical, social and mental well-being.

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### *Conflicts of interest*

There are no conflicts of interest.

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