

Assessment of Impairment of Quality of Life in Foot Eczema and Correlation thereof with Epidemiological Data of its Patients: A Cross-Sectional Study

Abstract

Background: Eczema of foot adversely impacts daily activities, work productivity, and interpersonal relationships. **Materials and Methods:** This cross-sectional, questionnaire-based study collated epidemiological data of 70 outpatients of foot eczema, evaluated their quality of life by 10-item dermatology life quality index (DLQI) questionnaire, and undertook the correlation thereof. **Results:** Cases were predominantly males (48; 68.5%); 26 (37.1%) belonged to fifth decade of life and 47 (67%) presented within 12 months of onset. Dorsa of feet was involved in most (59; 84.2%) cases. Itching was a universal complaint followed by scaling (51; 72.9%), dryness (22; 31.4%), and oozing (21; 30%). History of atopy was reported by 15 (21.4%) patients; tobacco and/or alcohol abuse 32 (45.7%) patients; past treatment was received by 37 (52.9%) patients; and winter aggravation in 9 (12.3%) patients. Mean DLQI score was 13.64; with very large effect (11–20) on QoL in 38 (54.3%) patients; moderate (6–10) in 15 (21.4%) patients; extremely large (21–30) in 9 (12.9%) patients; and small (2–5) in 8 (11.4%) patients. Mean scores of questions of DLQI tool were 2.46 in first question (symptoms), 1.99 in fifth (social activities); 1.81 in seventh (working/studying); and 0.17 in fourth (clothes) question. Significant ($P < 0.05$) impairment of quality of life emerged with respect of burning, scaling, oozing, history of atopy, seasonal variation, and past treatment. **Conclusion:** Our study reports significant association of atopy, winter aggravation, past treatment, burning, scaling, and oozing with adverse quality of life in our study on cases of foot eczema and appears to be first study from India.

Keywords: Atopy, dermatology life quality index, foot eczema

Introduction

Extreme disablement and inability to walk as a result of pain of secondarily infected fissures, blisters, and weeping are integral to the chronic, relapsing dermatosis of foot eczema.^[1] In addition, a high proportion of its patients are embarrassed, have low self-esteem, and feel discriminated in social and societal relationships.^[2] No classification system exists for foot eczema; however, the entities proposed are atopic foot eczema, irritant or allergic contact dermatitis, lichen simplex chronicus, footwear dermatitis, and occupational foot eczema. Gaining insights into the impairment of their quality of life (QoL) may help in the treatment of this, often forsaken, condition whose data—even regarding its prevalence per se as an occupational dermatosis^[3]—is virtually nonexistent in the literature. Merely three studies reported from Europe—one, of

chronic foot eczema (Netherlands) and two, just of lichen simplex chronicus of foot (Greece and Bulgaria) have evaluated the QoL in these patients.^[4–6] Correlation of impairment of QoL with epidemiological characteristics of cases of foot eczema has never been reported despite the comments regarding patients' feelings of trivialization/underestimation of the psychological impact of their eczema by the treating doctors thereby contributing to suicidal ideation.^[7,8] Hence, we undertook assessment of QoL of cases of foot eczema and its correlation thereof with epidemiological data in this, probably the first, such reported study hereto.

Materials and Methods

This observational cross-sectional questionnaire-based study was undertaken

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after ethical clearance from our institute enrolled, with their written informed consent of 70 clinically diagnosed cases of foot eczema aged 17 years or above from the attendees of the dermatology outpatient department of our tertiary care hospital from September 2018 to March 2019. Patients with a positive skin scraping for fungus on potassium hydroxide mount or those who had palmoplantar psoriasis, cutaneous, and/or nail psoriatic lesions elsewhere, venous eczema, and lichen planus hypertrophicus, which mimic foot eczema, were excluded from the study clinically. Diagnosis of atopic dermatitis was done on the basis of history and clinical criteria. After recording demographic and epidemiological details in a predesigned proforma, each patient was asked to fill in a validated Hindi/Marathi version of 10-item dermatology life quality index (DLQI) questionnaire. Question number *one* and *two* concerned symptoms and feelings; *three* and *four*, daily activities; *five* and *six*, leisure work; *seven*, work and school; *eight* and *nine*, personal relationships; and *ten*, treatment. Each question was scored on a 3-point scale (3 = very much, 2 = a lot, 1 = a little, and 0 = not at all). Range of score was 0–30.^[9] The total score of all questions was grouped into five categories: 0–1: no effect; 2–5: small effect; 6–10: moderate effect; 11–20: large effect; and 21–30: extremely large effect.^[10]

Quantitative variables were described using means and standard deviations for statistical analysis. For qualitative variables, percentage and Chi-square test were performed.

Karl Pearson coefficient of correlation was performed using the Statistical Package for the Social Sciences (SPSS) software program, version 20 (SPSS, Chicago, Illinois) as appropriate. A two-tailed probability value of 0.05 or less was considered statistically significant.

Results

Seventy patients (males: females: 48:22) constituted our study population; their age range was 17–70 years with mean age of 44.34 ± 11.52 years. The most common age incidence was during the fifth decade of life seen in 26 (37.1%) cases, followed by fourth and sixth decades in 15 (21.4%) each, third in 8 (11.4%), seventh in 4 (5.71%), and second decade in 2 (2.85%); fourth to six decades accounted for 56 (80%) cases of our study population. Laborers (44.1%), professionals (15.7%), and cleaners (15.7%) constituted over three-fourth (78.5%) of our patients occupation-wise. Over two-thirds (67%) presented within 12 months of disease onset; 21.4% within 13–24 months and the remainder (11.4%) of our study patients, after 2 years [Table 1].

The lesions were present on dorsa of feet in 59 (84.2%); ankle, 34 (48.5%); web spaces, 10 (14.2%); and sole, 8 (11.4%). Concurrent with the dorsa, lesions also involved ankles in 26 (37.1%); web spaces, 5 (7.14%) and sole, 2 (2.85%) [Table 1 and Figure 1].

Table 1: Demographic factors of patients with foot eczema

Factors	Variants	n	%
Age group (years)	11-20	2	2.85
	21-30	8	11.4
	31-40	15	21.4
	41-50	26	28.5 37.1
	51-60	15	21.4
	61-70	4	5.71
Occupation	Laborer	33	47.1
	Housewife	8	11.4
	Professional	11	15.7
	Housekeeping	11	15.7
	Technician	5	7.1
	Student	2	2.9
Duration (months)	1-12	47	67.14
	13-24	15	21.43
	>24	8	11.43
Site	Dorsum	59	84.28
	Web spaces	10	14.28
	Sole	8	11.42
	Ankle	34	48.57



Figure 1: Patients with foot eczema

Itching, complained universally, was followed by complaints of scaling in 51 (72.9%), dryness in 22 (31.4%), oozing in 21 (30%), burning in 11 (15.7%), pain in 10 (14.3%), and fissuring in 8 (11.4%). Burning, scaling, and oozing correlated significantly ($P < 0.05$) with QoL [Table 2]. Aggravating factors observed in 29 (41.4%) of our study patients constituted contact with irritants, 15 (51.7%); regular use of footwear, 12 (41.3%); and wet work, 9 (31%). History of atopy was given by 15 (21.4%); winter aggravation complained by 9 (12.8%); of substance abuse including tobacco consumption, 32 (45.7%); occasional alcohol intake, 11 (15.7%); and history of past treatment by 37 (52.9%) patients. Seasonal variation, atopy, and past treatment were correlated significantly ($P < 0.05$) with the QoL [Table 3].

Table 2: Symptoms of foot eczema and their correlation with QoL

Variants (n)	Small effect (2-5) n=8	Large effect (6-10) n=15	Very large effect (11-20) n=38	Extremely large effect (21-30) n=9	P
Pruritus (70)	8 (100%)	15 (100%)	38 (100%)	9 (100%)	-
Burning (11)	2 (25%)	2 (13.3%)	3 (7.8%)	4 (44.4%)	0.047
Pain (10)	0	1 (6.6%)	5 (13.1%)	4 (44.4%)	0.635
Scaling (51)	2 (25%)	8 (53.3%)	31 (81.5%)	8 (88.8%)	0.003
Dryness (22)	2 (25%)	2 (13.3%)	10 (26.3%)	1 (11.1%)	0.625
Fissuring (8)	1 (12.5%)	2 (13.3%)	4 (10.5%)	1 (11.1%)	0.993
Oozing (21)	1 (12.5%)	1 (6.6%)	12 (31.5%)	7 (77.7%)	0.002

Table 3: Epidemiological factors of foot eczema and their correlation with QoL

Variants (n)	Small effect (2-5) n=8	Large effect (6-10) n=15	Very large effect (11-20) n=38	Extremely large effect (21-30) n=9	P
Aggravating factors (29)	2 (25%)	4 (26.6%)	17 (44.7%)	6 (66.6%)	0.189
Seasonal variation (9)	0	5 (33.3%)	4 (10.5%)	0	0.040
Atopy (15)	0	1 (6.6%)	9 (23.6%)	5 (55.5)	0.015
Tobacco (32)	6 (75%)	5 (33.3%)	18 (47.3%)	3 (33.3%)	0.232
Past treatment (37)	5 (62.5%)	2 (13.3%)	23 (60.5%)	7 (77.7%)	0.004

The mean DLQI score was 13.64 ± 5.99 ; effect on impairment of DLQI scored: *Very large* (score 11–20) in 38 (54.3%); *moderate* (6–10) in 15 (21.4%); *extremely large* (21–30) in 9 (12.9%); and *small* (2–5) in 8 (11.4%) patients [Table 4]. Impairment of QoL, further evaluated by the score of each question of the DLQI questionnaire, revealed that question 1, that is, “Over the last week, how itchy, sore, painful or stinging has your skin been,” had the highest mean score of 2.46; whereas question 4, that is, “Over the last week, how much has your skin influenced the clothes you wear,” had the lowest (0.17). The individual scores of all questions are statistically significant ($P < 0.05$) [Table 5].

Discussion

Our study had a male preponderance (M:F::2.1:1), unlike the reported female preponderance of $\leq 1.7:1$ in studies from Pondicherry, Kolkata, and Karnataka.^[11-13] The abundance of male workers in many industrial factories at our location likely caused their gender preponderance.

The majority (80%) of participants in our study, as also the previous study from Pondicherry (57%), belonged to the age group of 31–60 years, although the study from Karnataka had 12 (24%) cases belonging to this age group.^[11,13]

Majority (67%) of our study population presented within 12 months of disease onset. In the Pondicherry study, 27 (13.9%) presented within 6 months and 118 (60.8%), 6 months to 5 years.^[11] Our patients could have had more severe eczema and/or could have been motivated for getting compensation in cases of industrial workers.

Laborers (44%) accounted for a large proportion of our study population, followed by cleaners and professionals

Table 4: DLQI score in foot eczema

Range of score	n (%)
2-5 (small effect)	8 (11.4%)
6-10 (large effect)	15 (21.4%)
11-20 (very large effect)	38 (54.3%)
21-30 (extremely large effect)	9 (12.9%)

(15.7% each); this could have been due to their increased exposure to allergens/irritants, wet work in the industrial units requiring regular footwear usage. Farmers and housewives comprised the majority of the two previous Indian studies.^[11,12]

Dorsa of feet were involved in most of our study population in 59 (84.2%) and also in two previous Indian studies.^[11,13]

Itching was the universal complaint, followed by scaling in 51 (72.9%), dryness in 22 (31.4%) and oozing in 21 (30%), likewise the participants in the previous two Indian studies complained of itching in 88% and 61.9%.^[11,13] An Indonesian study reported pruritus in 58 (85.2%) and pain in 7 (10.3%).^[14]

Burning, scaling, and oozing were significantly associated ($P < 0.05$) with impaired DLQI of our study population. However, there was a glaring lack of comparative DLQI in the literature.

The aggravating factors were observed in 29 (41.4%) cases in our study: Irritants and the consequent use of soaps and detergents in 15 (51.7%); prolonged footwear usage, 12 (41.3%) and wet work, 9 (31%). Rubber-based adhesives in cases of shoe dermatitis, as also soaps and detergents, have been implicated as predisposing factors by various authors in several studies, most commonly among workers employed in construction industries.^[15-17]

Table 5: Mean scores of answers to individual question

Question	1	2	3	4	5	6	7	8	9	10
Mean	2.46	1.60	1.70	0.17	1.99	1.13	1.81	1.23	0.99	0.59
SD	0.630	0.923	0.823	0.380	0.843	0.867	0.982	0.837	0.807	0.807
<i>P</i>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

A personal or family history of atopy was given by 15 (21.4%) of our study patients; the Indonesian study reported such history in 19 (29.7%).^[14] Much higher occurrence (122; 60.7%) of atopy was reported in German study and a very low (11, 0.05%) in the Pondicherry one.^[3,11] However, not much is known about the prevalence of foot eczema in cases with atopic dermatitis.

Of our study population, 32 (45.7%) were smokers; 112 (64%) of the above mentioned German study also smoked.^[3]

Winter aggravation in our study patients (9; 12.3%) at a comparatively temperate location was surprisingly lower than that reported from warmer Pondicherry (48%) and Manipal, 45.2%.^[11,13]

A significantly higher impact on the QoL of our study patients with atopy and seasonal variation needs to be assessed further with larger studies as we failed to find any such study.

Surprisingly, patients treated previously for eczema had a significantly greater impairment of QoL than those previously untreated; this paradoxical impairment with attempted treatment may probably be the result of increased expectations.

The mean DLQI score (13.64 ± 5.99) of our study population of foot eczema underscores the significant negative impact on their QoL. The QoL in females (16.63 ± 5.93) were more affected than the males (12.27 ± 5.56). The DLQI score was 12.2 in the only such report from a previous European study on foot eczema from Netherlands.^[4] However, this score was lower in studies of cases of lichen simplex chronicus of feet from Bulgaria (8.58) and Greece (9.34);^[5,6] the higher score in ours may be due to more severe dermatitis and compensation bias in a significant segment of our patients employed as industrial labor.

Impairment of QoL in our study population emerged to be of very large effect (score 11–20) in 38 (54.3%); moderate effect (score 6–10) in 15 (21.4%); extremely large effect (score 21–30) in 9 (12.9%); and small effect (score 2–5) in 8 (11.4%) patients. In the Bulgarian study, majority (110, 57.9%) scored between 6 and 10 followed by 11–20 score in 48 (25.3%) and 2–5 in 32 (16.8%).^[5]

The impairment in QoL in foot eczema was further assessed by the mean score of each question of DLQI: Question *one* (symptoms) scoring highest (2.46), followed by question *five* (social activities), 1.99 and question *seven* (working/studying), 1.81, whereas question *four* (clothes) scored,

0.17. The mean scores of all questions were statistically significant ($P < 0.05$). In the Bulgarian study on the lichen simplex chronicus of feet, mean DLQI scores were significantly higher for Q1 (symptoms), Q2 (feelings) and Q10 (treatment); the mean score of Q1 lower but that of Q2 and 10 higher as compared to our study.^[5] The foot eczema patients in our study were more concerned about their symptoms which prevented them from working and carrying out leisure activities. Foot eczema therefore can cause annoyance due to physical symptoms (pain/itch), self-embarrassment, and daily discomfort due to treatment.

The limitations of our study were non-confirmation of the etiology of foot eczema by patch testing and lack of correlation of impairment of QoL with the severity of eczema due to non-availability of any measuring tool in the literature.

Conclusion

Foot eczema occurred in our study most commonly among the male laborers during the fifth decade of their life. Those with history of atopic dermatitis and tobacco smoking were identified to be at greater risk. The statistically significant correlation of the mean DLQI score with complaints of burning, scaling, oozing and/or history of atopy, seasonal variation and past treatment, indicates the necessity of inculcating extra sensitivity among the treating physicians by incorporating DLQI score in routine assessment of these cases provided the findings of our small study get verified in future larger studies on this dermatological adversity having a major impact on the psyche, emotion, and well-being of its sufferers.

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Conflicts of interest

There are no conflicts of interest.

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