Hong Kong J. Dermatol. Venereol. (2016) **24**, 5-16

Original Article

Quality of life in adults with endogenous eczema in Singapore

新加坡的內源性濕疹成年患者的生活質量調查

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Background: Endogenous eczema (EE) is a common chronic skin condition resulting from internal physiological processes not necessarily requiring external stimuli; common subtypes include atopic eczema, xerotic eczema, and non-specific endogenous eczema. The chronicity and relapsing-remitting nature of EE has a significant psychological impact on many patients. **Objectives**: To survey the domains of quality of life (QoL) and overall QoL of adult outpatients with EE, as well as the factors correlating with their QoL. **Methods:** A 17-item cross-sectional interview was conducted with 110 adults with prevailing EE from the dermatology clinic of National University Hospital, Singapore. Dermatology Quality of Life Index (DLQI) was the instrument used to assess QoL. **Results:** Scores for the overall scale ranged from 0 to 27, median=5.00 and SD=6.543. EE had no effect on the quality of life in 21.8%, small effect in 36.4%, moderate effect in 16.4%, very large effect in 19.1% and extremely large effect in 6.4% of the study participants. Of the domains examined by the DLQI, symptoms and feelings were the most affected. The proportion of those unaffected by EE increased in the geriatric population and those with less severe eczema (all $p<0.05$). There was no gender correlation. **Conclusion:** EE patients were significantly affected by their symptoms and feelings. Apart from providing medical treatment, dermatologists need to find ways to ameliorate symptoms experienced by patients with EE, and assess their emotional burden. This is especially important when handling the young and those with more severe disease.

背景：內源性濕疹是一種常見的慢性皮膚病，它的出現源於內在的生理過程，並不一定需要外來刺激引發；常見的亞型包括異位性皮膚炎、乾性濕疹和非特異性的內源性濕疹。內源性濕疹的慢性及反覆不斷發作及緩解的特性，使不少患者的心理產生了顯著的影響。**目標**：調查有內源性濕疹病人

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的生活品質，生活品質的領域以及與他們生活品質相關的因素。**方法**：110有內源性濕疹在新加坡國立大學醫院的皮膚科診療所門診的成年人完成有 17 項的問卷。皮膚學生活品質問卷被用來評估生活品質。**結果**：最低分數是 0 ，最高 27 ，中位數 =5.00 和標準差 =6.543 。內源性濕疹對 21.8% 的研究參與者沒有影響，對 36.4% 有小的影響， 16.4% 有中等的影響， 19.1% 有很大的影響， 6.4% 有極大的影響。皮膚學生活品質問卷檢查的領域當中，以「症狀和感覺」這一領域的影響最大。此外，不受影響者的比例在老年群組及非嚴重濕疹群組內明顯地較其他群組高（$p<0.05$），而性別和生活品質則不見有相關性。**結論**：內源性濕疹患者顯著地受到本身「症狀」和自我「感覺」困擾。除提供醫療外，皮膚科醫生需要尋找方法來舒緩內源性濕疹患者的症狀，同時評估他們的情緒負擔。這些舉措在處理年輕及較嚴重的濕疹個案時尤爲重要。

Keywords: Adult, eczema, quality of life, Singapore

關鍵詞：成年人、濕疹、生活品質、新加坡

Introduction

Endogenous eczema (EE) is a chronic skin condition. Common subtypes include atopic eczema (AE), xerotic eczema and non-specific endogenous eczema. The diagnosis of non-specific endogenous eczema is made after excluding the diagnosis of other forms of endogenous eczema and contact eczema through history, physical examination, and if necessary, allergen testing. [1] Less common subtypes include palmoplantar and dyshidrotic eczema. EE results from internal physiological processes not necessarily requiring external stimuli, as opposed to exogenous eczema, an example of which is contact dermatitis, caused by external factors.[1]

EE is an important consideration not only from a medical perspective but also from a psychosocial point of view due to its chronic and relapsing-remitting nature affecting patients' quality of life (QoL), often for many years at a time. The various subtypes of EE can have a profound impact on patients' occupations, personal relationships, activities of daily living, and other instrumental aspects that together determine a patient's overall QoL.

AE is known to affect 2-10% of adults and 15-30% of children, with a prevalence that has been doubling or tripling in industrialised countries during the past three decades.[2,3] With 45% of all AE cases beginning as early as the first 6 months in infancy, AE completely subsides by adolescence in 60% of cases; however, they may suffer from relapses during adulthood,[2] which significantly impact their QoL depending on the severity.[4,5]

The multi-faceted aspect of EE is an important consideration, especially the emotional component of the disease and the physical symptoms. This is best illustrated by AE, which affects multiple aspects of a patient's QoL – physical, emotional, and psychosocial.[6-9] It is known that clinically-diagnosed anxiety, depression or other psychiatric disorders are often associated with AE.[10-12] Hand eczema, another subset of EE, is known to affect patients' occupations as well as their physical well-being.[13-15] In fact, the mental component of hand eczema has an integral role in the overall progression and prognosis of the disease, with many hand eczema patients suffering from comorbid anxiety, depression or other mood disorders.[16]

The emotional component also plays a part in the pathophysiology of the disease. AE is a multifactorial condition shaped by both genetic predisposition as well as environmental exposure, where it is known to be triggered by various physical and psychosocial factors.[17-19] AE patients often suffer acute flare-ups or exacerbations of

chronic disease following triggers that include stressful life events, which in adults include interpersonal relations, bereavement, work-related difficulties, and other significant emotional and psychological life events.[20-22] EE patients including AE and hand eczema patients may then respond to the increased stress or triggers with increased pruritus and scratching that will further exacerbate the disease severity.[17]

In addition to the pathophysiological symptomatology of AE, its pharmacological treatment further impacts on patient satisfaction.[6-7] Therapeutic approaches are generally similar across the different types of EE. However, unlike AE, not all types of EE are immune-mediated responses. The current treatment regimen for EE typically involves moisturisers for maintenance and prevention of flare-ups as well as topical corticosteroids and/or topical immunomodulators for flares; additionally, oral antihistamines or antibiotics may be added depending on the symptoms and on whether infection is present.[2, 20]

Many studies have focused on evaluating QoL in AE patients,[6-11] as well as in hand eczema patients.[13-16] However, the QoL of people with xerotic eczema and non-specific endogenous eczema are not well studied. As an entity itself, EE is less commonly examined in terms of QoL. From AE to hand eczema to xerotic eczema, EE represents a significant disease burden in Singapore. A study done at a dermatological referral centre in Singapore demonstrated an increase in the prevalence of EE from 31% to 67% between 1973-1990.[23] Accordingly, this study aims to examine the QoL and factors affecting it in adult EE patients in the ambulatory setting.

Materials and methods

Study design

This was a cross-sectional study whereby information on the severity and nature of eczema was obtained followed by an interviewer-administered questionnaire in either the English or Chinese language. The Institutional Ethics Committee approved the study (ref. no. 2012/00102, National Healthcare Group Domain Specific Review Board). A verbal informed consent was obtained from all participants, as the study was of minimal risk and involved no recording of identifiable information. Participation was entirely voluntary.

There were two trained interviewers and all the questionnaires were checked for completeness.

Study population

The study population consisted of 124 consecutive adults aged 21 years and over with pre-existing EE recruited over seven weeks in 2012 from the dermatology clinic of the National University Hospital. The age of twenty-one years was selected as it is the legal voting age in Singapore, though age of adulthood is commonly 18 years in other countries.[24]

The study excluded patients with a) seborrhoeic eczema because it usually does not require long-term therapy; and b) venous eczema because it is attributable to chronic venous insufficiency, a reversible cause. The exclusion of seborrhoeic eczema was based on the dermatologists' observation of its' transient course at our site of study. However, this might not hold true at other sites, as the course of the disease has been reported to be variable. Some individuals have occasional exacerbation of disease, while others experience a chronic waxing and waning course.[25]

There were 14 non-responders, 10 of whom declined to participate in the survey and the remaining four were unable to communicate adequately.

Study instruments

The attending dermatologists specified the nature of eczema and graded its severity using the Investigator's Global Assessment (IGA) scale during the consultation.

Investigator's Global Assessment grades the disease from clear, almost clear, mild, moderate, severe to very severe disease on a scale of 0 to 5.[26]

The 10-item Dermatology Life Quality Index (DLQI), developed and validated by Finlay and Khan,[27] was used to assess QoL. The DLQI score is calculated by summing the scores of its 10 questions. The maximum score is 30 and the minimum is 0. The scores represent the effect of the skin disease, in this study EE, on the QoL. A score of 0-1 indicates that there is no effect at all on the patient's life, 2-5 a small effect, 6-10 a moderate effect, 11-20 a very large effect and 21-30 an extremely large effect. It can be analysed under six different domains, namely symptoms and feelings, daily activities, leisure, work and school, personal relationships and treatment.

Seventeen items on demographics and medical details were obtained from the patients (Appendix 1).

Data analysis

The data were processed using Microsoft Excel XL and Predictive Analytics Software version 18. The Pearson's chi-squared test was used to compare proportional data. The Spearman's rank correlation analysis was used to study the correlation between the overall DLQI and IGA score. A probability (p) <0.05 was considered statistically significant.

Results

The questionnaires of 110 participants were analysed.

Characteristics of the study population (Table 1)

There was a slight male predominance (58.2%), mainly Chinese (86.4%), and the median age was 56 (range of 21-79).

The majority of the patients had non-specific EE (37.3%) and AE (36.4%); followed by xerotic eczema (20.0%) and the rest. At the point of the survey, most patients were having mild eczema (44.5%). Almost all patients were using topical corticosteroids (98.2%) and moisturisers (90.9%).

Table 1. Characteristics of outpatients with EE (n=110)

Variable	No. (%)
Gender	
Male	64 (58.2)
Female	46 (41.8)
Age group	
Median (range)	56 (21-79)
21-29	22 (20.0)
30-39	10 (9.1)
40-49	14 (12.7)
50-59	19 (17.3)
60-69	19 (17.3)
70-79	26 (23.6)
Ethnic group	
Chinese	95 (86.4)
Malay	6 (5.5)
Indian	5 (4.5)
Others	4 (3.6)
Type of endogenous eczema	
Non-specific endogenous	41 (37.3)
Atopic	40 (36.4)
Xerotic	22 (20.0)
Palmoplantar	5 (4.5)
Dyshidrotic	1 (0.9)
Prurigo nodularis	1 (0.9)
Severity of eczema (IGA score)	
Clear (0)	8 (7.3)
Almost clear (1)	17 (15.5)
Mild (2)	49 (44.5)
Moderate (3)	27 (24.5)
Severe (4)	9 (8.2)
Application of topical corticosteroids	
Yes	108 (98.2)
Application of moisturiser	
Yes	100 (90.9)

EE, endogenous eczema; IGA, Investigators' Global Assessment

DLQI

Figure 1 shows the effect of EE on the QoL. EE had at least a moderate effect in 41.9% of the patients.

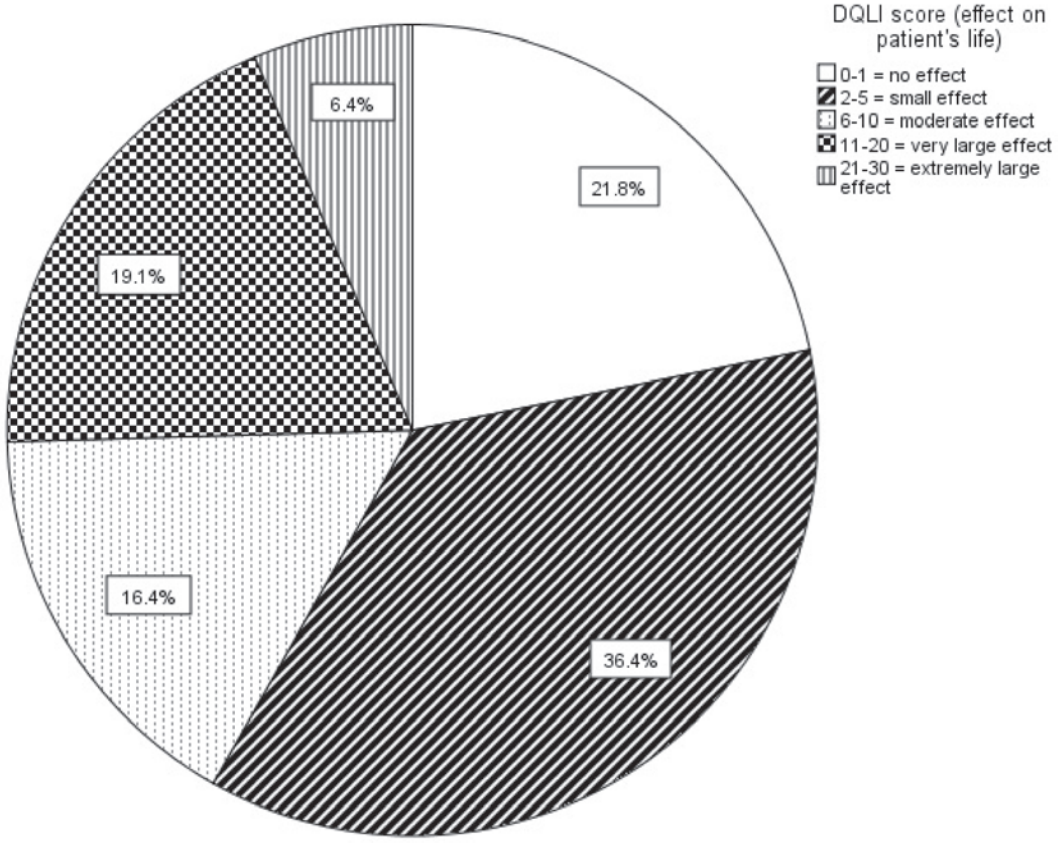
Table 2 shows the DLQI scores for the patients. Analysis of ten individual questions of DLQI revealed that the two questions pertaining to symptoms and feelings each had a median score of one while the other eight questions had median scores of zero. Overall, the domain "Symptoms and Feelings" had the highest median score of two.

Factors affecting scores for DLQI, domains of DLQI and individual questions of DLQI (Table 3)

Comparison was made between participants with and without effect on QoL.

Demographic characteristics

About 85% of the participants aged below 55 years reported some effect on QoL. This was significantly higher than 63.9% of those 55 years and above (p=0.011).



EE, endogenous eczema; QoL, quality of life; DLQI, Dermatology Life Quality Index

Figure 1. Effect of EE on patients' QoL as measured by DLQI.

When individual DLQI domains were analysed, participants aged 55 years and above were significantly more likely to score 0 for daily activities (37.8% vs 66.7%, p=0.004), leisure (40.5% vs 75.0%, p=0.001), work and school (50.0% vs 88.9%, p=0.001), personal relationships (52.7% vs 91.7%, p<0.001) and treatment (55.4% vs 77.8%, p=0.023). There was no significant difference in the domain for symptoms and feelings (5.4% vs 8.3%, p=0.555).

A significantly larger proportion of participants who spoke mainly English reported some effect on QoL compared to those who spoke mainly Chinese, Malay or Tamil (86.5% vs 70.7%, p<0.05).

Characteristics of endogenous eczema

Type of eczema

Participants with non-xerotic eczema were statistically more likely to report effect on QoL

Table 2. DLQI scores (n=110)

DLQI questions	Individual score Median (range)	DLQI domain	Aggregate score Median (range)
1. Over the last week, how itchy, sore, painful or stinging has your skin been?	1 (0-3)	Symptoms and feelings	2 (0-6)
2. Over the last week, how embarrassed, or self-conscious have you been because of your skin?	1 (0-3)		
3. Over the last week, how much has your skin interfered with you going shopping or looking after your home or garden?	0 (0-3)	Daily activities	1 (0-6)
4. Over the last week, how much has your skin influenced the clothes you wear?	0 (0-3)		
5. Over the last week, how much has your skin affected any social or leisure activities?	0 (0-3)	Leisure	0 (0-6)
6. Over the last week, how much has your skin made it difficult for you to do any sport?	0 (0-3)		
7. Over the last week, has your skin prevented you from working or studying? If "No", over the last week how much has your skin been a problem at work or studying?	0 (0-3)	Work and school	
8. Over the last week, how much has your skin created problems with your partner or any of your close friends or relatives?	0 (0-3)	Personal relationships	0 (0-6)
9. Over the last week, how much has your skin caused any sexual difficulties?	0 (0-3)		
10. Over the last week, how much of a problem has the treatment for your skin been, for example by making your home messy, or by taking up time?	0 (0-3)	Treatment	
		DLQI overall	5 (0-27)

DLQI, Dermatology Life Quality Index

Table 3. Factors affecting QoL in Outpatients with EE (n=110)

	Effect on QoL		p-value
	None n=24 (21.8%)	Small, Moderate, Large, Extremely Large n=86 (78.2%)	
Variable	**No. (%)**	**No. (%)**	
Age group			
Below 55 years	11 (14.9)	63 (85.1)	0.011
55 years and above	13 (36.1)	23 (63.9)	
Gender			
Male	12 (18.8)	52 (81.2)	0.358
Female	12 (26.1)	34 (73.9)	
Ethnic group			
Chinese	22 (23.2)	73 (76.8)	0.392
Malay/Indian/Others	2 (13.3)	13 (86.7)	
Main language spoken			
English	7 (13.5)	45 (86.5)	0.045
Chinese/Malay/Tamil	17 (29.3)	41 (70.7)	
Educational level			
Primary and below	7 (28.0)	18 (72.0)	0.395
Secondary and above	17 (20.0)	68 (80.0)	
Paying status			
Non-subsidised	6 (24.0)	19 (76.0)	0.764
Subsidised	18 (21.2)	67 (78.8)	
Type of eczema			
Xerotic	9 (40.9)	13 (59.1)	0.015
Non-Xerotic	15 (17.0)	73 (83.0)	
Other skin condition			
Yes	5 (22.7)	17 (77.3)	0.908
No	19 (21.6)	69 (78.4)	
Other chronic medical problem			
Yes	17 (26.6)	39 (84.8)	0.155
No	7 (15.2)	47 (73.4)	
Family history of eczema			
Yes	10 (31.2)	22 (68.8)	0.125
No	14 (17.9)	64 (82.1)	
Consulted other doctors			
Yes	10 (15.9)	53 (84.1)	0.080
No	14 (29.8)	33 (70.2)	

QoL, quality of life; EE, endogenous eczema

compared to those with xerotic eczema (83.0% vs 59.1%, p=0.015)

Severity of eczema (Figure 2)

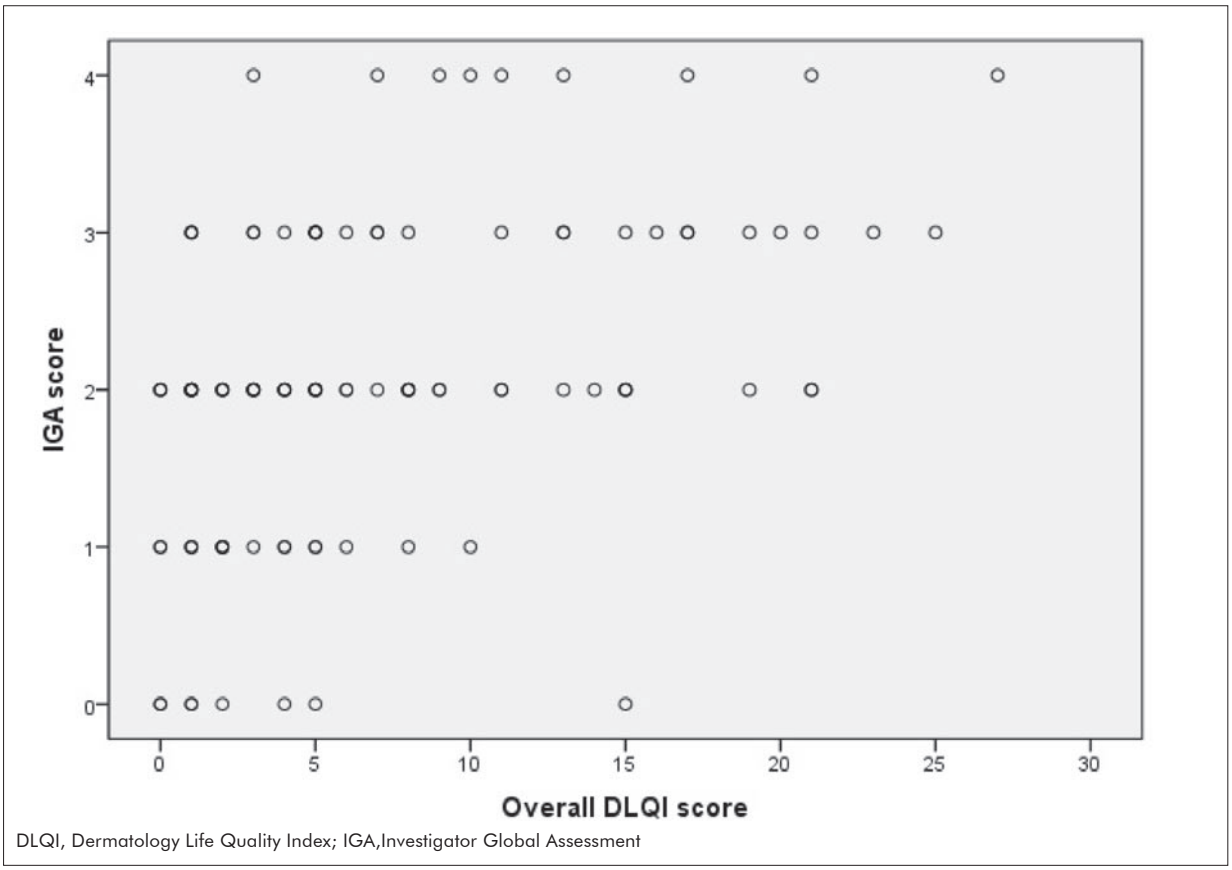
A statistically significant mildly positive correlation between scores for overall DLQI and IGA was found using the Spearman's rank correlation (r=0.462, p<0.001).

When scores for individual DLQI components were analysed with IGA, positive correlation was only found with symptoms and feelings (r=0.443, p<0.001) and daily activities (r=0.442, p<0.001), but not for leisure (r=0.330, p=0.001), work and school (r=0.268, p=0.005), personal relationships (r=0.332, p<0.001) and treatment (r=0.234, p=0.014).

Factors showing no statistically significant effect on overall DLQI (Table 3)

There was no statistically significant difference in the overall DLQI scores regardless of gender, ethnicity and educational level.

Participants who had skin condition(s) other than EE, chronic medical condition(s) or a family history of eczema did not show any statistically significant difference in their overall DLQI scores. There was also no difference in DLQI scores between those in subsidised or non-subsidised clinics or those who have consulted a primary care physician before.



DLQI, Dermatology Life Quality Index; IGA,Investigator Global Assessment

Figure 2. Scatter plot of overall DLQI and IGA scores: Spearman's rank correlation = 0.462 (p<0.001).

Discussion

Severity of eczema and QoL

With regard to the level of disease severity of EE and QoL, our results show a mildly positive correlation between overall DLQI scores and the severity of eczema ($r=0.462$, $p<0.001$). Applying the DLQI and general Short Form-36 (SF-36) questionnaire to measure QoL and the Eczema Area and Severity Index (EASI) to measure the severity of eczema, a study of 75 patients from Brazil in 2007 also found a statistically significant mild relationship between scores for QoL and the severity of eczema ($p<0.001$), with a stronger correlation found with overall DLQI scores ($r^2=0.26$) than with mean SF-36 scores ($r^2=0.19$).[4] A study from Denmark in 2004 found significantly lower QoL in 101 AE patients versus 30 controls, and a strongly positive significant correlation between overall DLQI scores and the severity of eczema as measured by the investigator visual analogue scale (INVAS) ($r=0.82$, $p<0.001$).[28] Despite no clear consensus on the association between disease severity and QoL, the general expected trend is that more advanced disease would result in a greater effect on QoL. Our results, and the two above mentioned studies, fit within the expected trend of decreasing QoL with increasing severity of disease, despite the fact that different scales were used to measure QoL and the severity of disease.

Domains of QoL

Of the six major domains examined by the DLQI, "Symptoms and Feelings" was the most affected by participants with EE. This reflects that the symptoms – itch, soreness and pain, as well as feelings of embarrassment and self-consciousness affected the patients' quality of life most. The correlation was strongest between the "Symptoms and Feelings" domain and IGA scores, compared to other domains. This study also found that the older patient population was affected more than the younger ones in this domain. The patients 55 years and older were more likely to score "0" for all domains of the DLQI ($p<0.05$), with the exception of symptoms and feelings ($p>0.555$). The above Denmark study,[28] along with a Leeds study[29] on QoL also found that "Symptoms and Feelings" domain was the most affected in AE.

Individual question analysis showed no difference between the median score for symptoms and feelings. They were both higher than the rest with a score of one. The itch, sore, pain or sting of the skin and being embarrassed and self-conscious could be the reasons that prompted these participants to seek treatment. The emotional aspect is certainly very important to the well-being of someone with EE.

There is no publication showing the direct comparison of symptoms and feelings using the DLQI. Studies from Brazil[4] and Denmark[28] and a study in Detroit[5] using the SF-36 questionnaire showed that mental components were more significant than physical ones. However, a direct comparison cannot be drawn between the symptoms and feelings of the DLQI to the physical and mental components of the SF-36 respectively. Still, we would like to suggest that symptoms are likely as important as feelings only in tropical countries like Singapore, where the warmth and humidity exacerbate the symptoms of EE. Warm, humid and high sun exposure climates have been reported to correlate with poorly controlled disease.[30]

Of the major domains of QoL, "Treatment and Leisure" was the least responsive to disease severity. This may be affected by a limitation of the IGA severity scale used, where the extent of skin surface area affected and the locality of lesions are not taken into account.

Gender and QoL

Our study did not find a gender difference in the overall DLQI scores. A European study in 2008 which examined 416 patients with hand-specific eczema also did not find any significant difference between QoL in males and females either, despite males having more severe eczema.[13]

Limitations

This study has several limitations. Firstly, we managed to recruit 110 patients with EE who met all inclusion criteria and completed the questionnaire. The overall response rate was 89%. While the response rate was high, future research would be needed to assess a larger number of qualifying patients with EE in a multi-centred setting to improve generalisability. The larger sample size would also allow for sub-analysis of the quality of life of patients with different subtypes of endogenous eczema.

Secondly, the study used only the DLQI scale to assess the QoL of patients with EE, and only the IGA scale to assess the severity of EE. Although the DLQI scale has been validated with high sensitivity to change, repeatability, and internal consistency,[26] adding another test such as the Short Form-36 (SF-36) may provide more information on QoL.[31] Future research on QoL among EE patients should consider such a combination of tools. Also, the DLQI only reflects the patients' QoL over the past week; it can be administered at frequent intervals to enable a better reflection of the patients' QoL over a longer period of time.

The IGA is the third most commonly utilised scale for atopic dermatitis after EASI and scoring atopic dermatitis (SCORAD) and has been shown to correlate with the EASI.[26] However, it has not been validated, does not take into account the skin surface area, and has a lack of responsiveness and finer discrimination for disease severity and subjective symptoms.[26] SCORAD is the most utilised scale and has a maximum severity score of 103 as compared to the EASI and IGA with maximum severity scores of 72 and 6, respectively.[26] The greater ranges in SCORAD and EASI scales may contribute to the greater specificity and more nuanced assessment of patients' disease severity. Given these considerations, further research may consider implementing a combination of IGA with SCORAD scales.

Conclusion

Our study has shown that EE patients in Singapore were most significantly affected by their symptoms-itch, sore, pain or sting of the skin; and feelings – being embarrassed and self-conscious. We suggest that the symptoms factor is particularly important in Singapore as our year-long hot and humid climate likely plays an instrumental role in influencing its severity. Also, there might be an association between anxiety and mood disorders with EE. Younger patients and those with more severe disease are more affected by EE, whereas gender does not show any correlation with QoL.

These have implications on the management of EE, where dermatologists should assess the symptoms and emotional burden of patients with EE and tailor treatment accordingly. Therapies can include education of patients to ameliorate itch and psychodermatological alongside conventional treatment. This is especially important when handling younger patients and those with more severe disease, irrespective of gender.

Further research should aim to assess the QoL of patients in South-East Asia (SEA), for comparison with worldwide populations as to whether symptoms feature strongly in SEA, and the extent of influence by a tropical climate. Interventional studies can be done to assess the effectiveness of psychodermatology in improving QoL of patients with EE.

Acknowledgements

Undergraduate research opportunities programme by the National University of Singapore, which funded the printing of the questionnaires. We also thank Professor A. Y. Finlay for permission to use the DLQI.

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Appendix 1. Details on the 17 items in the questionnaire

- 9 items on participants' demographic characteristics, such as age, gender and occupation.
- 3 items on health utilisation:
  1. paying(subsidy) status
  2. ever consulted other doctors
  3. number of consultations with a dermatologist at the specialist outpatient clinic (National University Hospital)
- 5 items on patient's medical details:
  1. any chronic medical problem(s) other than eczema
  2. concurrent skin condition(s)
  3. family history of eczema
  4. nature of eczema
  5. severity of eczema