

Quality Of Life and its Associated Factors among Children with Atopic Eczema in Kelantan, Malaysia

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Abstract

Introduction: Atopic eczema is a chronic relapsing skin disease occurring in children and it causes disruption on the quality of life of the sufferer.

Objectives: To determine the quality of life and its associated factors among children with atopic eczema in Kelantan, Malaysia.

Methodology: A cross sectional study was conducted among children diagnosed as atopic dermatitis attending Dermatology Clinic, HRPZ II, Kelantan, Malaysia. Children Dermatology Life Quality Index (CDLQI), and severity of the disease (SCORAD) questionnaire were used. Data was entered and analysed by Simple and General Linear Regression using PASW 18.

Result: A total of 110 children were recruited with response rate of 100%. Quality of life score was skewed to the right with median (IQR) of 8.0 (8.0). Subanalysis of the items showed that items concerning the symptoms (Q1), embarrassment (Q2), sleep loss (Q9) and treatment difficulty (Q10) were mostly affected. Only disease severity was the significant associated factor for quality of life with regression coefficient of 0.18 (95%CI: 0.09,0.26) (P< 0.01).

Conclusion: The overall children's quality of life was not impaired because not all items in CDLQI were equally affected. Disease severity was a significant associated factor for quality of life among children with atopic dermatitis in Kota Bharu, Kelantan.

Keywords: atopic dermatitis, quality of life, disease severity

Introduction

Atopic eczema is a chronic relapsing skin disease occurring in children where majority of the disease occurring in those below 5 years of age¹ and it is common in the developing countries. In Malaysia, the prevalence of atopic eczema among patients who attended dermatology clinic of National University of Malaysia was 3.7%.² The prevalence among 5-7 years age group Kelantanese children was 13.7% and 12-14 years age group was 9.9%.³ The prevalence rate of eczema symptoms among primary school children was 17.6% and 13% among secondary school in Kota Bharu.⁴

Health Related Quality of Life was defined as subjective perception of the impact of health status, including disease and treatment, on physical, psychological and social functioning well being.⁵ It has becoming an outcome parameter in most of clinical studies of incurable and chronic illnesses and the utilization of Health Related Quality of Life measure has enabled examination of the impact of the disease on children's life and their family members.⁶

There are a number of factors influencing quality of life. Hon, K. *et al.*, found that itch and sleep disturbances were generally more marked among young children aged less than 10 years old. Significant itch and sleep disturbance affected both genders equally but were generally more marked in children with atopic eczema aged between 5 to 10 years old compared to those aged 11 to 16 years old (63% vs 43% for itch; 61% vs 40% for sleep disturbance).⁷ The impact of atopic eczema on children's quality of life was more severe for girls and the child to parent relationship progressively worsen with the girls age.⁸ Boys showed a lower prevalence of current symptoms of eczema but there was little difference in prevalence between boys and girls for symptoms of severe eczema and a slightly higher prevalence for boys for lifetime reported eczema.⁹

Psychological problems among children attending outpatient dermatology clinics with moderate or severe eczema too had been found to be twice than those of normal schoolchildren.¹⁰ A case-control study evaluating the degree of psychological difficulties among children with atopic eczema, mentally distressed mother and family support system reported the rate of psychological disturbances measured by abnormal child behavior were twice as likely as the controls. The effects were significantly different in a moderate to severe atopic eczema ($p=0.018$).¹¹

Atopic eczema was known to cause misery to the sufferer, psychosocial problems, reduced quality of life and disruption to family life.¹² As many studies reported increasing trend in the prevalence of atopic eczema, quality of life of children with the disease is expected to be tremendous in future.

This study was aimed to determine the quality of life and its associated factors among children with atopic eczema in Kota Bharu, Kelantan. Diagnosis of atopic eczema was made by consultant dermatologist and quality of life is defined as reflection of the way that patients or parent perceive and react to their child's health status and other non-medical aspects of their live, which includes family relationship, friendship and social life.¹³

Methods

Study design and population

This is a cross-sectional study. The source population was children with atopic eczema attending Dermatology Clinic, Hospital Raja Perempuan Zainab II, Kelantan, Malaysia. The inclusion criteria include aged 5 to 18 years old. Presence of concomitant serious medical illness like leukemia, cerebral palsy, alopecia totalis, epilepsy, attention deficit and hyperactive disorder or autism and newly diagnosed patient who was naïve to specific treatment of atopic eczema were excluded. Systematic random sampling 1:2 was applied based on the registry record for any given appointment date. The sample size for this study were calculated using single mean formula to determine the quality of life of children with atopic eczema and comparing two means using Power and Sample Size Calculation software (version 1.0.13)¹⁴ for each of the associated factors for quality of life. Of these, the biggest sample size yielded was for the variable age with the standard deviation for quality of life score among children aged older than 10 years old of 6.1¹⁵, detectable difference of 2 after considering its clinical importance and feasibility of the study, alpha of 0.05, power of 80%, and non-response rate of 10%, the sample size calculated was 110. Hence, it has adequate power to generalize the finding to the reference population i.e. children with atopic eczema in Kota Bharu, Kelantan.

Research tools

The methods of data collection were via case report form, Children's Dermatology Life Quality Index (CDLQI), Scoring Atopic Dermatitis (SCORAD) score and medical record review. CDLQI was the first validated specialty-specific dermatology scale for school-age children and has been shown to demonstrate good repeatability and sensitivity to clinical change. The Cronbach's alpha for Malay version of CDLQI questionnaire was 0.92.¹³ The questions asked were pertaining to the events that happen in the last week to allow for accurate recall. The questionnaire contained 10 items covering the symptoms i.e., itchiness and soreness, emotions, friendship, clothing, leisure activities, sports, school/holiday, relationships, sleep loss and treatment difficulties over the last one week. The time span was chosen as such for a better recall of the events in their life. For each question there will be a four-part Likert scale options, which corresponded to scores of 0, 1, 2, or 3 respectively. If subject answered "not relevant", the item was scored with a zero. The overall score was calculated by summation of each question, which yielded a result between 0 and 30. The higher the score means the greater impact on children's quality of life. Although this happen infrequently, items that were left blank (missing data) were processed as follows: if one or two questions were left unanswered it was assumed that the respondent considered those questions were not relevant to them and, therefore they were each scored 0 out of 3. There was no percentage rounding-up based on the answers to the correctly answered questions. If more than 2 items were left blank, the questionnaire was rejected.¹⁶

SCORAD is a clinical score that is widely used in Europe for the assessment of atopic eczema severity. The score was determined on two criteria i.e. the extent the eczema and the intensity of the most representative lesions. This was performed using rule of nine chart.¹⁷ SCORAD was a weighted index, with more emphasis on the intensity (multiplying by a factor of 3.5) but less

weight on the extent (multiplying by a factor of 0.2).⁷ The assessment was done using objective SCORAD (maximum score of 83) for each children participant during their visit to dermatology clinic. Subjects were further categorized as having mild (total score <15), moderate (15-40) and severe (score >40) according to objective (extent and intensity of the lesions) SCORAD results. As SCORAD varied with the stage of a treatment course, all patients were assessed during a course of treatment. Patient who suffered from disease flare-ups and superimposed skin infection were treated accordingly.

Medical records were reviewed for information such as type of medications, past experience of atopic eczema and skin condition during previous follow-up.

Method of data collection

Data collection was conducted from January 2010 till January 2011. Both children and respective parent or caregiver were briefed regarding the purpose of the study. Face to face interview was conducted for those consented and review of medical records was done by the researcher.

Data analyses

Data was analyzed using Statistical Program for Social Sciences (PASW statistics) version 18. The distributions and frequencies were examined for normality and inequality. Mean and standard deviation were calculated for numerical variables and frequency and percentages were calculated for categorical variables. Descriptive analysis was used to determine the quality of life of children, while, Simple and General Linear Regression were used to determine the associated factors for quality of life in children with atopic eczema. The dependent variable was CDLQI score. The independent variables were disease severity, age, duration of illness, gender, patient educational status, parental educational status, personal history of asthma or allergic rhinitis, and family history of asthma, allergic rhinitis or atopic eczema. The level of significance was set at 0.05 using two-sided hypothesis testing.

Results

A total of 110 children were enrolled in the study giving a response rate of 100%. Table 1 summarizes the socio-demographic and medical characteristics with the median (IQR) age of the children of 9.0 (13.0) years old. The median (IQR) age at diagnosis and duration of illness was 30 (60.0) months and 60 (59.0) months. The proportion of children with personal history of asthma and allergic rhinitis was 55.5% and 43.6%, respectively. Half of them (50.9%) have a positive first degree family history of atopic eczema. Almost two-third (62.7%) suffered from moderate, one-third (30.9%) suffered from mild and only 6.4% suffered from severe atopic eczema.

Quality of life score was skewed to the right with median (IQR) of 8.0 (8.0). Subanalysis of the items showed that items concerning the symptoms (Q1), embarrassment (Q2), sleep loss (Q9) and treatment difficulty (Q10) were mostly affected (Table 2).

Table 3 showed the Simple and General Linear Regression results for associated factors of children's quality of life. Disease severity score was the only significant associated factor (<0.01). There was no significant interaction term between the significant variables and no multicollinearity problem. Residual plots indicate that overall model fitness, equal variance assumption, normality assumption and variable functional forms were satisfied. No outliers observed. Final model showed that for every 1 unit increased in disease severity score there was an increase of 0.18 unit in quality of life score (95% CI: 0.09,0.26) after adjusting for other variables.

Discussion

Children's quality of life

The CDLQI score of 8.0 in the present study was comparable to that of the previous study in Kuala Lumpur¹³ which was 10.0 and that of Singapore¹⁸ which was 8.5. During initial validation study of CDLQI in the United Kingdom, mean was 7.7 among the out-patient hospital-based population. In another study, David *et al.*, reported that the mean CDLQI score was 6.6 in the primary care setting in Michigan, USA where most of the subjects had mild to moderate eczema. The higher CDLQI median score observed in our study population was not surprising because the subjects in our study were those attending dermatology specialist clinics while the study by David *et al.*, was done in the primary care setting. This study agreed with the previous findings^{13,19,20} that atopic eczema had a major impact on symptoms and sleep as measured by disease-specific CDLQI score. Increased severity of atopic eczema was associated with increased impairment in domains of Health Related Quality of Life.^{19,21}

This study revealed that quality of life was impaired in children with atopic eczema but the various aspects of quality of life were not equally affected. Itchiness, sleep loss, embarrassment and treatment problems were the four main items that mostly affected quality of life of children with atopic eczema and these were consistent with other studies.^{6,7,12} As for the treatment aspect, most of the subjects had mild to moderate atopic eczema which was similar to Tay *et al* in Singapore.²² In both studies, subjects had consulted a doctor for medical advice at least once before recruitment period. However, the success of treatment relies on duration of topical cream application, fear of steroid, compliance to medication and side effects of antihistamines.²³

Other items of CDLQI such as being teasing or rejected by friends, sports and leisure activities were not much affected in this school-going children. This indicates that children in this study do not have problems with social activities at home, school or outdoor activities. The disease seems to affect more on personal domain such as itchiness and sleep loss rather than interpersonal issues.⁷ The nature of atopic eczema has been well studied in the literature.^{1,24} It involved environmental and antigenic interactions. The release of mediators causes the symptoms to manifest before it is visible. Scratch pathway triggered the biochemical changes in a person's

body. In view of majority of the subjects in this study experiencing mild to moderate disease, it is too early for the symptoms and signs to fully manifest. Hence, the milder symptoms do not cause much problem to prevent them from social and recreational activities.

Associated factors for children's quality of life

Disease severity was the only associated factor for children's quality of life in this study. Given the fact that clinical factors were provider-assessed severity in our methodology, SCORAD was objectively done based on the extent and intensity of the lesions that the subject manifest during study period. The use of SCORAD was in accordance with recommendation by experts.¹⁷ In Asia, disease severity and quality of life was not significantly different between age group and gender. Therefore, assessment of individual aspect of children's quality of life should be performed. However, quality of life should not be assumed less impaired in children with milder disease.^{7,15} Any change in the overall score may be negligible when a large improvement in one domain of life in atopic eczema can be offset by a large deterioration in another domain of life.^{7,15} Individual items of quality of life in childhood atopic eczema may not be affected equally. The items that most negatively affected quality of life were symptoms, sleep loss and difficulties with the treatment.^{13,16,25-27}

Some studies reported gender difference.^{8,19} Kiebert *et al.* found that CDLQI score was significantly different in girls as compared to boys [mean (SD): 6.8 (6.4) vs 4.6 (4.8); p=0.03].¹⁹ The impact of atopic eczema in young children, aged less than four years was more severe for girls.⁸

This study reported that one unit increment in the disease severity score will increase 0.18 unit quality of life score. In a community-based study on eczema in United Kingdom, Ben-Gashir *et al.*, quantified that one unit change in the disease severity score was equivalent to 0.12 unit changes in the quality of life score.²⁸ Overall, when disease severity is getting severe, the children's quality of life will be more impaired. So, the higher quality of life score that the subject had, the more impaired quality of life was expected.

The present study had few limitations. First, the cross sectional assessment of quality of life makes it was impossible to draw firm conclusion about the exact relationship between various explanatory variables. Second, psychological factors may confound children's quality of life. Anja Wittkowski *et al.* indicated that perception of stigma and depression accounted for 44.5% of the variance in quality of life in adult atopic eczema.²⁹ However, both Stigmatization and Eczema Questionnaire (SEQ) and Hospital Depression Scale (HDS) were not suitable in out-patient hospital setting and the procedure of data collection is lengthy and time consuming. Third, information bias was still possible because during data collection procedure, the parent or care giver were allowed to guide and help. However, CDLQI was designed to be a proxy measure to make it more user-friendly. Clinical audit by Beattie and Lewis-Jones had found that the difference was minimal and negligible between self-assessed measure and parental guide.³⁰

Several recommendations could be made. First, disease severity should be an utmost clinical consideration in dealing with childhood atopic eczema and the local management should be

according to the latest guideline. Second, quality of life of children should be measured in reference to what subjects perceive or desired and achievable in relation to their goals, standards, expectation or concerns. Hence, criterion validity of CDLQI against the Medical Outcome Study Short Form-36 Health Survey (SF-36) is recommended. Third, a confirmatory study with regards to the age of children with atopic eczema from 5-16 years old is suggested due to the wide difference in the developmental stage in this age group.

Conclusion

The overall children's quality of life was not impaired because not all items in CDLQI were equally affected. Disease severity was a significant associated factor for quality of life among children with atopic dermatitis in Kelantan, Malaysia. Hence, disease severity needs to be considered and management needs to be updated along with the latest guideline for childhood atopic eczema.

Competing Interest

None of the authors has any conflict of interest by publishing this article.

Authors' Contribution

All the authors have contributed significantly in the supervision, analysis, drafting and revising the article to its completion. They take full responsibility for its content and have read the manuscript fully.

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Ethical Policy

The research protocol was approved by the Research and Ethical Committee, School of Medical Sciences, Universiti Sains Malaysia on 29th January 2009 and Research and Ethical Committee of Ministry of Health Malaysia on 30th July 2009.

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Table 1: Socio-demographic and medical characteristics of children

Variables	Median (IQR)	n (%)
Socio demographic characteristics		
Age (years)	9.0 (13.0)	
Family income (RM)	1500 (1500)	
Sex		
Boy		52 (47.3)
Girl		58 (52.7)
Race		
Malay		94 (85.5)
Non Malay		16 (14.5)
Education level of subject		
Pre school		25 (22.7)
Primary		51 (46.4)
Secondary		34 (30.9)
Education level of parent		
Primary		10 (9.1)
Secondary		61 (55.5)
Tertiary		39 (35.4)
Medical characteristics		
Age at diagnosis (months)	30.0 (60.0)	
Duration of illness (months)	60.0 (59.0)	
Disease severity score	22.0 (19.6)	
Personal history of Asthma		
Absent		60 (55.5)
Present		50 (44.5)
Personal history of Allergic Rhinitis		
Absent		62 (56.4)
Present		48 (43.6)
Family history of Asthma		
Absent		55 (50.0)
Present		55 (50.0)
Family history of Atopic dermatitis		
Absent		56 (50.9)
Present		54 (49.1)
Family history of Allergic Rhinitis		
Absent		57 (51.8)
Present		53 (48.2)

Table 2: Subanalysis of Children's Dermatology Life Quality Index Items

Items	Mean (SD)
Q1 itch	1.6 (0.80)
Q2 embarrassment	1.0 (0.91)
Q3 Friendships	0.9 (0.84)
Q4 clothes/shoes	0.9 (0.93)
Q5 leisure/hobbies	0.8 (0.89)
Q6 swimming/sports	0.0(1.0) ^a
Q7 school/holidays	0.8 (0.81)
Q8 teasing/bullying	0.0(1.0) ^a
Q9 sleep	1.2 (0.86)
Q10 treatment	1.1 (0.84)

^a median(IQR)

Table 3: Associated factors for children's quality of life

Variables	SLR ^a			GLR ^b		
	b ^c (95% CI ^d)	t stat ^e	P value	Adj. b ^f (95% CI ^d)	t stat ^e	P value
Socio-demographic factors						
Age (yrs)	0.08 (-0.21,0.37)	0.55	0.582			
Family income (RM)	0.00 (-0.01,0.00)	-1.27	0.208			
Gender						
Male						
Female	0.23 (-2.05,2.50)	0.20	0.843			
Race						
Malay						
Non Malay	2.32 (-0.87,5.51)	1.44	0.153			
Subject Education						
Preschool						
Primary	-1.90 (-4.77, 0.96)	-1.32	0.190			
Secondary	1.09 (-1.99,4.14)	0.70	0.483			
Parental Education						
Primary						
Secondary	0.93 (-2.89, 4.85)	0.47	0.638			
Tertiary	-0.59 (-4.67, 3.48)	-0.29	0.773			
Medical factors						
Age at diagnosis (mths) ^g	0.02 (-0.01,0.04)	1.55	0.124			
Duration of illness (mths)	-0.02 (-0.04,0.01)	-1.20	0.234			
Disease severity score	0.17 (0.09,0.25)	4.11	<0.01	0.18 (0.09,0.26)	4.30	<0.01
Comorbid asthma						
Absent						
Present	0.18 (-2.10,2.50)	0.16	0.876			
Comorbid allergic rhinitis						
Absent						
Present	1.30 (-0.98,3.57)	1.13	0.260			
F/ history of asthma						
Absent						
Present	-0.18(-2.45,2.09)	-0.16	0.874			
F/ history of allergic rhinitis						
Absent						
Present	-1.56 (-3.81,0.69)	-1.37	0.173			
F/history of atopic eczema						
Absent						
Present	-0.34 (-2.61,1.93)	-0.30	0.765			

^a Simple Linear Regression^b General Linear Regression (R²= 0.15; There was no significant interaction and no multicollinearity problem; model assumptions met).^c Crude regression coefficient^d Confidence Interval^e t statistic^f Adjusted regression coefficient^g Not included in General Linear Regression due to the possibility of collinearity problem