International Journal of Contemporary Pediatrics
Babu A et al. Int J Contemp Pediatr. 2024 Apr;11(4):423-428
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: https://dx.doi.org/10.18203/2349-3291.ijcp20240731

Original Research Article

Atopic dermatitis in children: a cross-sectional study of its impact on quality of life

Asha Babu[1]*, Naveen Thomas[2], Rekha Zacharias[1], Johny Vakayil Francis[1], Dimple Patel[1]

[1]Department of Paediatrics, Medical Trust Hospital, Kochi, Kerala, India
[2]Department of Dermatology, Medical Trust Hospital, Kochi, Kerala, India

Received: 14 February 2024
Revised: 07 March 2024
Accepted: 11 March 2024

***Correspondence:**
Dr. Asha Babu,
E-mail: drashababu25@gmail.com

ABSTRACT

Background: Atopic dermatitis, characterized by chronic inflammation of the skin, manifests with symptoms such as itching, skin discomfort, and sleep disturbances, significantly impacting the physical health and daily functioning of affected children. We embarked on this study to assess the Quality of Life of children with AD, identify factors that influence their QoL, and determine the specific domains of QoL most affected by the condition.
Methods: Children up to 16 years of age, who met the Hanifin and Rajka's diagnostic criteria for AD, were identified. The severity of AD was assessed using the severity scoring of atopic dermatitis index, and QoL was assessed using validated questionnaires: the infants dermatitis quality of life index for children under 4 years and the children's dermatology life quality index for children 4 years and above.
Results: A total of 70 children with AD were enrolled in the study. The mean QoL (IDQOL/CDLQI) score for children with AD was 6.7±5.05 and QoL was significantly impaired in children with more severe disease. The domains of QoL most affected by AD were related to pruritus, sleep disturbances, mood changes and treatment related issues. The duration of illness and the presence of other atopic comorbidities showed a significant correlation with QoL impairment, whereas age, gender and socioeconomic status demonstrated no such correlation.
Conclusions: This study highlights the substantial impact of AD on the QoL of affected children, especially due to symptoms like itching and sleep disturbances.

Keywords: Atopic dermatitis, Quality of life, SCORAD, CDLQI, IDQOL

INTRODUCTION

Atopic dermatitis (AD) is a chronic inflammatory skin condition that is characterized by recurrent episodes of pruritus, erythema, scaling, and lichenification. It is one of the most common skin diseases in children, affecting 10-20% of children worldwide.[1] It may be associated with respiratory allergies such as asthma or allergic rhinitis, together known as the atopic triad.[2] The aetio-pathogenesis of AD is complex with genetics, skin barrier function, immunity, and environmental factors interacting synergistically with each other to cause and aggravate the disease.[3] AD occurs most commonly in infants and prevalence decreases with increasing age.[2] Onset is most common between 3 and 6 months of age with approximately 60% of patients developing eruption in the first year of life and 90% by 5 years of age. While majority of affected individuals have resolution of disease by adulthood, 10% to 30% continue to remain symptomatic and a smaller percentage develop new onset symptoms during adulthood.[4] AD is not a life-threatening illness, but it causes many symptoms including itching, skin discomfort and sleep disturbance. These symptoms adversely affect physical health and function thereby

negatively impacting the quality of life (QoL) of patients and their families. It is characterized by emotional disturbances and social dysfunctions, such as stress, embarrassment, frustration, fussiness, social isolation, negative self-esteem, and poor self-image. AD may interfere with sleep, play, sports, hobbies, school attendance and normal development of patients.[5] The unfortunate occurrence of these adverse consequences clearly depicts the detrimental effect of AD on quality of life of children and has paved the path to numerous studies on the impact of AD on QoL all over the world.[6,7] QoL is a widely used metric, influenced by physical health, psychological state, level of independence and social relations and is largely perceived as the quality of an individual's daily life. Health related quality of life (HRQoL) which denotes state of an individual's QoL pertaining to health, disease, and treatment, is needed for comparison between alternate treatments, allocation of resources in health care and auditing of health services.[6] The impact of AD on QoL has been studied extensively in developed countries, where several instruments have been developed and validated to measure the QoL of children with AD, such as the Infants Dermatitis Quality of Life Index (IDQOL) for children <4 years and the Children's Dermatology Life Quality Index (CDLQI) for children >4 years.[8] However, there is a paucity of data on the QoL of children with AD in developing countries, where the prevalence of AD has been increasing due to urbanization, industrialization, and changes in lifestyle and hygiene.[1] Moreover, the QoL of children with AD may vary depending on the cultural, social, and economic context of different regions. Therefore, the aim of this study was to examine the QoL of children with AD in a hospital setting in Kerala, India, using the IDQOL and CDLQI questionnaires. The specific objectives were to assess the impact of AD on the QoL of children, to identify the patient variables that influence the QoL, and to determine the domains of QoL that are most affected by AD.

METHODS

This was a hospital based cross-sectional study, conducted at medical trust hospital, Kochi, among children attending Paediatrics and Dermatology outpatient departments from September 2021 to June 2022. The study protocol was approved by the Institutional Ethics Committee and informed consent was obtained from the parents or guardians of the participants. The study population consisted of children up to 16 years of age of either gender, who were diagnosed with AD according to the Hanifin and Rajka's criteria.[9] Children with other chronic illness which could potentially impact QoL were excluded from the study. Both children and caregivers were briefed regarding purpose of study and relevant socio-demographic data was collected and patient characteristics identified.

Instruments used for the study

Severity scoring of atopic dermatitis (SCORAD) index

SCORAD index is the most widely used disease-severity scale in atopic dermatitis.[10] The SCORAD index uses the rule of nines to assess disease extent and evaluates five clinical characteristics to determine disease severity: erythema, oedema/papulation, oozing/crusts, excoriation and lichenification. SCORAD index also assesses subjective symptoms of pruritus and sleep loss with Visual Analogue Scales (VAS). The SCORAD index ranges from 0 to 103, with higher scores indicating more severe AD. Based on the SCORAD index, the participants were classified into three groups: mild (SCORAD <25), moderate (SCORAD 25-50), and severe (SCORAD >50). SCORAD index has been found to be valid and reliable, and it has shown excellent agreement with global assessments of disease severity.[11]

Scales to assess quality of life

Based on April 2019 consensus conference by the harmonising outcome measures for eczema (HOME) initiative recommendation, the IDQOL for children <4 years and the CDLQI for children > 4 years were used to assess quality of life of children.[12]

Children's dermatology life quality index

It is the most widely used QoL instrument used in Atopic dermatitis. The questionnaire is designed for children of ages 4 through 16. CDLQI is completed by the child with the help of an adult, if necessary, preferably a parent. The questionnaire consists of 10 questions that encompass different aspects of child's life that could be affected by skin disease. The instrument includes physical symptoms such as itching and sleep loss as well as psychosocial questions regarding friendships, bullying, school performance, sports participation, and enjoyment of vacation. The questions were graded from 0-3, with possible maximum score of 30 with higher scores representing worse QoL.[11,13]

Infants' dermatitis quality of life index

It is the scale used to determine QoL of children with AD upto the age of 4 years. It consists of 10 questions regarding an infant or child's difficulties with mood, sleep, bathing, dressing, play, mealtimes, other family activities and treatment. Each question is graded from 0-3 with a maximum total score of 30. Higher number correlates with a greater impairment of quality of life.[11,14]

Sample size calculation

Based on the study by Kumar et al it is observed that the Prevalence of AD in India is 6.75%.[15] Desired precision is 7 % and with 95% Confidence Interval, the minimum required sample size is 50. Formula for calculation was:

$$n = z^2_{\left(1-\frac{\propto}{2}\right)} p(1-p)/d^2$$

Where, p=Expected proportion=6.75%, d=Absolute precision=7%, $1-\frac{\propto}{2}$=Desired Confidence level=95%. Thus, sample sine was calculated as 50.

Statistical analysis

SPSS version 20 was used for statistical analysis. Qualitative (categorical) variables were represented by frequency and percentage analysis. Quantitative (continuous/score) variables were represented by mean and standard deviation. Kruskal Wallis test was performed to find the relationship between each item and severity. Kruskal Wallis test and Mann-Whitny test were performed to find the relationship between QoL and other variables. A p value less than 0.05 was taken as statistically significant.

RESULTS

This study was conducted in a tertiary care hospital in Kerala, India among children attending pediatric and dermatology clinics from September 2021 to June 2022.

During the study period, 70 children with AD were identified of whom 57.1% were males and 42.9% were females. The study included children upto 16 years of age and the mean age of the participants was 7.3±4.2 years, of whom majority belonged to the 6-12 years age group (40%). The study population, predominantly consisted of upper middle class (33%). In this study, majority of children had an early onset of disease at <1 year (49%). The average duration of illness was 3.7 years and majority of children had duration of illness less than 1 year (41.4%). Among the cases taken for the study, around 61.4% cases had other atopic comorbidities. The most noted comorbidities were allergic rhinitis (54.1%) and food allergy (40.2%). In the study group, higher proportion of children had moderate disease severity (44.3%), followed by those with mild disease severity (38.6%). The socio demographic and clinical characteristics of study population are as demonstrated in (Table 1).

Mean QoL scores

The QoL of children with AD was measured using the IDQOL and CDLQI questionnaires, depending on the age of the participants. The QoL scores obtained in the study are summarized in (Table 2). The maximum score obtained in the study was 20 and the minimum score was 0. The mean IDQOL score was 5.88±6.24 and the mean CDLQI score was 6.98±4.5. The mean QoL (IDQOL/CDLQI) score for the whole study population was 6.7±5.05.

Table 1: Demographic and clinical characteristics of study participants.

Variables	N	%
Age (years)		
<1	7	10.00
1-3	9	12.90
3-6	16	22.90
6-12	28	40.00
>12	10	14.30
Gender		
Male	40	57.10
Female	30	42.90
Socio-economic class		
Upper	16	22.90
Upper middle	33	47.10
Lower middle	16	22.90
Upper lower	5	7.10
Atopic comorbidities		
Present	43	61.40
Absent	27	38.60
Age at onset (years)		
<1	34	48.60
1-6	8	11.40
6-12	10	14.30
>6	18	25.70
Duration of Illness (years)		
<1	29	41.40
1-5	24	34.30
>5	17	24.30
Severity of disease		
Mild	27	38.60
Moderate	31	44.30
Severe	12	17.10
Total	70	100.00

Table 2: Mean QoL Scores in the study.

Variables	Mean	SD	Median	Range
IDLQI	5.889	6.249	4.5	0-18
CDLQI	6.981	4.535	5.5	0-20
QOL (IDLQI/ CDLQI)	6.7	5.005	5	0-20

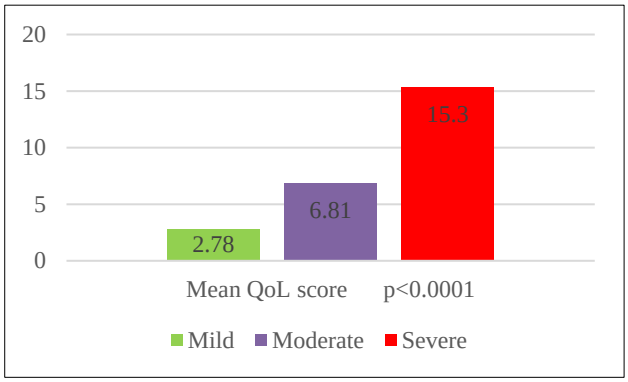

Figure 1: Correlation of QoL score with severity of the disease.

Correlation with severity

The severity of AD was assessed using the SCORAD index, and the participants were classified into mild (n=27, 39%), moderate (n=31, 44%), and severe (n=12, 12%) groups. The QoL score was significantly higher in severe cases compared to mild and moderate cases, as shown in (Figure 1). The mean QoL score for mild, moderate, and severe AD was 2.78±1.99, 6.81±2.61, and 15.3±3.41, respectively. The difference was statistically significant (p<0.001).

Table 3: Relationship of quality of life with demographic & clinical characteristics.

Variables	QoL (Mean±SD)	P value
Age (years)		
<1	3.71±6.47	0.31
1-3	7.56±6.64	
3-6	5.69±4.19	
6-12	7.82±4.61	
>12	6.50±4.30	
Sex		
Male	6.43±5.11	0.599
Female	7.07±4.92	
Socio-economic class		
Upper	5.88±4.59	0.432
Upper Middle	7.30±5.41	
Lower Middle	5.56±4.44	
Upper Lower	9.00±5.24	
Atopic comorbidities		
Absent	4.93±3.98	0.018
Present	7.81±5.30	
Age at onset (years)		
<1	7.68±5.82	0.211
1-3	6.13±4.82	
3-6	3.90±1.97	
>6	6.67±4.19	
Duration of illness (years)		
<1	4.55±4.66	0.003
1-5	7.29±4.15	
>5	9.53±5.27	
Total	6.70±5.01	

Domains of QoL scores

The domains analysed under QoL and the mean scores are depicted in (Figures 2 and 3). Itching and scratching was found to be the most dominant parameter influencing both IDQOL and CDLQI scores with a mean of 1.167 and 1.67 respectively. Sleep and mood were also found to be significantly affected in higher proportion of children with AD, as evidenced by higher mean scores in both QoL measures

Correlation with patient variables

The relationship between the QoL score and the patient variables were assessed using Kruskal Wallis test and Mann-Whitney test and is summarized in (Table 3). The QoL scores positively correlated with the duration of illness and the presence of other atopic comorbidities, indicating that the longer the illness and the more the atopic comorbidities, the worse the QoL. The QoL score showed no correlation with age, gender, socioeconomic status or age at onset.

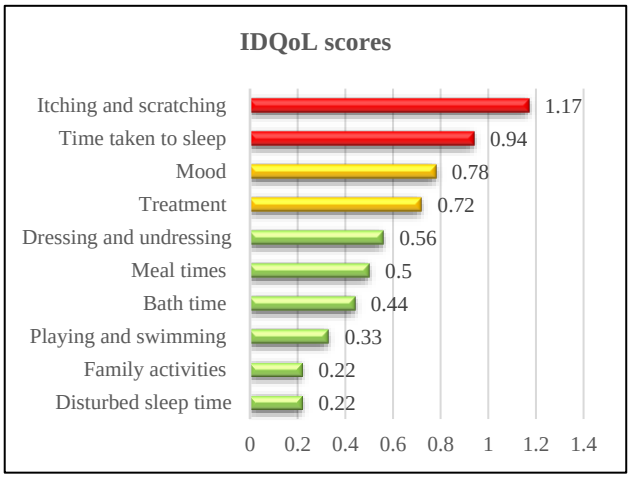

Figure 2: Domains of quality of life.

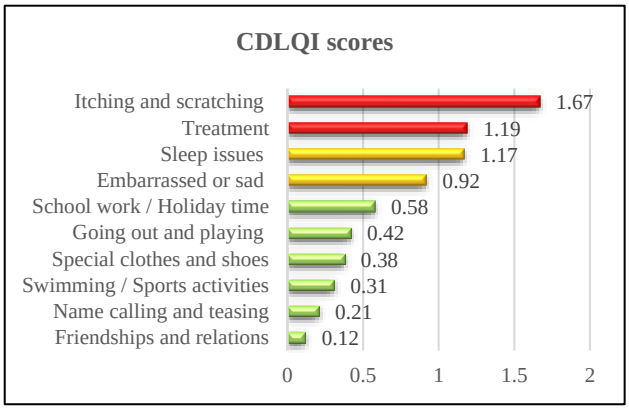

Figure 3: Figure 3: Domains of quality of life (CDLQI).

DISCUSSION

This study aimed to evaluate the QoL of children with AD in a hospital setting in Kerala, India, using the IDQOL and CDLQI questionnaires. The main findings of the study were that AD had a substantial impact on the QoL of children, especially in relation to symptoms like itching and sleep disturbances, that the QoL was significantly impaired in children with more severe AD, and that the QoL was influenced by the duration of illness and the presence of other atopic comorbidities. We embarked on this study since the available data on the disease burden of AD on QoL of children, is not well quantified in the Indian population. The QoL score obtained in the current study is comparable to the study done by Monti et al in Italy and Beattie et al in UK, which showed mean QoL scores of 7.57 and 7.7

respectively.[6,16] However, the score is lower than the scores of 9.2 and 9.24 observed in the studies by Lewis-Jones et al in UK and an Shariati et al in Iran respectively.[12,17] Lower mean QoL score might be attributed to the higher proportion of individuals with mild to moderate disease in the current study compared to these studies. Not surprisingly, in our study, the quality of life of children with AD was found to have a significant relationship with the severity of disease, which is consistent with the findings of numerous authors worldwide.[6,16,18,19] The occurrence of pruritus as a major contributor to the magnitude of the QoL scores, also displayed a similar trend in comparison to the existing literature.[2,5,20] In addition to this, the sleep latency and quality of sleep also contributed heavily to the QoL scores, which might be secondary to the occurrence of night pruritus. Numerous authors have made similar observations about the impact of sleep disturbances.[2,5,21] Puddicombe et al in a Nigerian study, noted that mood was negatively affected in a substantial population, largely owing to the occurrence of night pruritus and sleep disturbances, a finding which is also corroborated by the current study.[2]

The treatment of AD is usually multifaceted in nature, requiring skin care on a daily basis, lifestyle modifications and frequent hospital visits, which was not well received by a large subset of this population. The impact of this phenomenon was noted to be a substantial contributor to our scores, contrary to those of Wisuthsarewong et al in Thailand.[5] These findings point to the need for an organized treatment paradigm, with special emphasis on the psychological aspects of children and the caregiver, in our population. The quality of life of children with AD is found to be similar in all age groups. This is similar to the conclusions drawn from other studies, however Durovic et al showed that children with AD between the age of 5-9 years had most impaired QoL.[5,2,22] The impairment of QoL was not found to be gender specific in the current study, although some authors have reported gender differences in the impact of AD in QoL of children.[7,23,24] Although the QoL scores were found to be higher in the upper lower class compared to all other socio-economic classes and among children with early onset disease. However, this was statistically insignificant and is consistent with the findings of numerous authors.[2,5] QoL was significantly impaired in children with longer duration of disease and those with atopic comorbidities. This observation was well established by numerous authors worldwide.[5,7] These findings depict the need for special and aggressive supportive care in this group of children.

Limitations

Limitations of current study were; The study was conducted in a tertiary care centre, hence the findings may not be representative of the general population with AD, as it might have missed out a subset of children with milder manifestations not requiring hospital visits. Also, the QoL was measured using the IDQOL and CDLQI questionnaires, which are influenced by the parent's or guardian's perception of the child's QoL, rather than the child's own perspective.

CONCLUSION

This study concludes that AD significantly impairs the quality of life in children. Pruritus, sleep disturbances and treatment burden were found to be the major contributors to the occurrence of undesirable QoL scores, indicating the need for holistic management approaches that address both the physical and psychosocial aspects of the condition. The QoL of children with AD are influenced by the severity of AD, the duration of illness, and the presence of other atopic comorbidities, suggesting the importance of effective control of AD symptoms and prevention of disease exacerbations and complications.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Kanwar AJ, De D. Epidemiology and clinical features of atopic dermatitis in India. Indian J Dermatol. 2011; 56(5):471.
2. Puddicombe OT, Odusote OA, Lesi FE, Ayanlowo AO. Impact of atopic dermatitis on the quality of life of Nigerian children: A hospital-based cross-sectional study. South Afr J Child Health. 2018;12(4):137-42.
3. Kim J, Kim BE, Leung DY. Pathophysiology of atopic dermatitis: clinical implications. In: Allergy and asthma proceedings. USA: Ocean Side Publications; 2019:40(2);84.
4. Eichenfield LF, Tom WL, Chamlin SL, Feldman SR, Hanifin JM, Simpson EL, et al. Guidelines of care for the management of atopic dermatitis: section 1. Diagnosis and assessment of atopic dermatitis. J Am Acad Dermatol. 2014;70(2):338-51.
5. Wisuthsarewong W, Nitiyarom R, Boonpuen N. Childhood Atopic Dermatitis: Impact on Quality of Life in Thai Children and their Families. Astrocyte. 2017;4(3):144.
6. Monti F, Agostini F, Gobbi F, Neri E, Schianchi S, Arcangeli F. Quality of life measures in Italian children with atopic dermatitis and their families. Italian J Pediatr. 2011;37(1):59.
7. Drucker AM, Wang AR, Li WQ, Sevetson E, Block JK, Qureshi AA. The burden of atopic dermatitis: summary of a report for the National Eczema Association. J Investigat Dermatol. 2017;137(1):26-30.
8. Schmitt J, Apfelbacher C, Spuls PI, Thomas KS, Simpson EL, Furue M, et al. The Harmonizing Outcome Measures for Eczema (HOME) roadmap: a methodological framework to develop core sets of

outcome measurements in dermatology. J Investigat Dermatol. 2015;135(1):24-30.
9. Joji TA. Diagnostic standard for atopic dermatitis. JMA Pol. 2002;45(11):460-5.
10. Kunz B, Oranje AP, Labreze L, Stalder JF, Ring J, Taieb A. Clinical validation and guidelines for the SCORAD index: consensus report of the European Task Force on Atopic Dermatitis. Dermatology. 1997; 195(1):10-9.
11. Charman C, Williams H. Outcome measures of disease severity in atopic eczema. Arch Dermatol. 2000;136(6):763-9.
12. Rehal B, Armstrong A. Health outcome measures in atopic dermatitis: a systematic review of trends in disease severity and quality-of-life instruments 1985-2010. PloS One. 2011;6(4):e17520.
13. Lewis-Jones MS, Finlay AY. The children's dermatology life quality index (CDLQI): initial validation and practical use. Br J Dermatol. 1995;132(6):942-9.
14. Lewis-Jones MS, Finlay AY, Dykes PJ. The infants' dermatitis quality of life index. Br J Dermatol. 2001;144(1):104-10.
15. Kumar S, Nayak CS, Padhi T, Rao G, Rao A, Sharma VK, et al. Epidemiological pattern of psoriasis, vitiligo and atopic dermatitis in India: Hospital-based point prevalence. Indian Dermatol J. 2014;5(1):S6.
16. Beattie PE, Lewis-Jones MS. A comparative study of impairment of quality of life in children with skin disease and children with other chronic childhood diseases. Br J Dermatol. 2006;155(1):145-51.
17. Shariati M, Nasiri KR, Abaei HS, Goodarzi E, Hasanzadeh J, Ataee P, et al. The impact Atopic dermatitis on the life quality of childrens 1-6 year. Int J Pediatr. 2018;6(1):7003-11.
18. Hassab-El-Naby HM, Mohamed YF, Ammar MA, Mostafa AM. Assessment of quality of life among school children with atopic dermatitis in a locality in Cairo. J Egypt Women's Dermatol Soc. 2011;8(1):7-10.
19. Ben-Gashir MA, Seed PT, Hay RJ. Quality of life and disease severity are correlated in children with atopic dermatitis. Br J Dermatol. 2004;150(2):284-90.
20. Van Valburg RW, Willemsen MG, Dirven-Meijer PC, Oranje AP, Van der Wouden JC, Moed H. Quality of life measurement and its relationship to disease severity in children with atopic dermatitis in general practice. Acta Dermatol Venereol. 2011;91(2):147-51.
21. Ghani AA, Noor NM, Muhamad R, Ismail Z. Quality of life and its associated factors among children with atopic eczema in Kelantan, Malaysia. Int J Collab Res Int Med Public Health. 2012;4(11):10.
22. Đurović MR, Janković J, Spirić VT, Relić M, Timotijević ZS, Ćirković A, et al. Does age influence the quality of life in children with atopic dermatitis?. PloS One. 2019;14(11):23-9.
23. Chernyshov PV. Gender differences in health-related and family quality of life in young children with atopic dermatitis. Int J Dermatol. 2012;51(3):290-4.
24. Kiebert G, Sorensen SV, Revicki D, Fagan SC, Doyle JJ, Cohen J, et al. Atopic dermatitis is associated with a decrement in health-related quality of life. Int J Dermatol. 2002;41(3):151-8.

Cite this article as: Babu A, Thomas N, Zacharias R, Francis JV, Patel D. Atopic dermatitis in children: a cross-sectional study of its impact on quality of life. Int J Contemp Pediatr 2024;11:423-8.