



Does Gender Influence Quality of Life in Children with Atopic Dermatitis?

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ABSTRACT

Introduction: Atopic dermatitis (AD) is a chronic skin disease that has a significant impact on quality of life (QoL). The aim of this paper was to evaluate if gender affects some aspects of QoL in children with AD.

Materials and methods: The cross-sectional study was conducted at the Clinic of Dermatology and Venereology, Clinical Center of Montenegro, between August 2017 and July 2018 and included 200 children aged 5–16 years with AD diagnosis. The severity of disease was measured by the Three Item Severity (TIS) score, while QoL was assessed with the Children's Dermatology Life Quality Index (CDLQI). Socio-demographic data on children with AD were collected by a short questionnaire.

Results: The difference in overall CDLQI between boys and girls was not statistically significant. The domains that were most affected by AD were school/holidays (mean score 2.27 ± 0.65), and symptoms (mean score 2.22 ± 0.70). Swimming/sports activities, school/holidays, teasing/bullying and sleep disturbance were more affected in girls. Overall CDLQI score and CDLQI subscale scores (except school/holidays and sleep in boys) significantly correlated with TIS. According to multivariate logistic regression analyses statistically significant differences between two genders were not found for age, AD severity, concomitant atopic disease, and family history of atopic disease.

Conclusion: Although we did not find differences between the two genders in the overall health related QoL, this study confirmed the tendency for AD to have a more severe impact on girls' lives. These results may influence treatment and counselling of children affected with AD.

Key words: atopic dermatitis, children, gender, quality of life, CDLQI, TIS, dermatology, epidemiology

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ARTICLE INFO

Received: 18th December 2018
Revision received: 11th January 2019
Accepted: 19th February 2019

INTRODUCTION

Atopic dermatitis (AD) is the commonest chronic inflammatory skin disease in children with a significant burden on healthcare resources.¹⁻³

Although AD may occur at any age, it most often begins in infancy and childhood. The prevalence estimates of AD vary worldwide, with highest prevalence in developed, high-income countries, where AD affects over 20% of children.^{4,5} Over the last few decades the number of AD patients has doubled in most parts of the world, especially in low-income countries.³ AD has a great im-

act on quality of life (QoL) of the affected children.⁶⁻⁹ In order to effectively use QoL results, it is important to know about existing gender differences in QoL assessment. However, previously reported results concerning gender differences in QoL of young (0-4 age) and older children (5-16 ages) with AD were contradictory.¹⁰⁻¹⁶

The purpose of this study was to analyze gender differences in health-related QoL in older children (5-16 years of age) suffering from AD.

METHODS

Study design and participants

A cross-sectional study was carried out at the Clinic of Dermatology and Venereology, Clinical Center of Montenegro (CCM) in Podgorica between August 2017 and July 2018. The study included 200 children (78 boys and 122 girls) aged 5 to 16 years with confirmed AD diagnosis made using Hanifin and Rajka criteria.¹⁷ The study was approved by the Ethics Committee of the CCM, Podgorica. Written informed consent was obtained from parents of all 200 children with AD.

Data collection

Socio-demographic data on children with AD (child's gender, age, concomitant atopic disease and family history of atopic disease) were collected by a short questionnaire.

Disease severity was assessed using the Three Item Severity (TIS) score, which corresponds well with the more detailed objective SCORAD (SCORing Atopic Dermatitis) index.^{18,19} It is a simple scoring system which use three of the intensity items of the SCORAD index: erythema (0–3), edema (0–3), and excoriations (0–3) in one or several different representative areas with the maximum score of 9. Based on the TIS, the severity of AD was classified into mild (<3), moderate (3–5) and severe (≥6).

The health related QoL of children was measured using the Children's Dermatology Life Quality Index (CDLQI). The CDLQI is a specific QoL instrument for measurement of impact of skin diseases on QoL of children aged between 5 and 16 years.²⁰ It is 10 item structured questionnaire that assess symptoms and feelings (2 items), leisure (3 items), school or holidays (1 item), personal relationships (2 items), sleeping (1 item) and treatment (1 item). All questions are related to the week preceding its application. The item related to assessment of impact of AD on school activities has an alternative option to assess the effect of AD on holiday activities, in case the child is evaluated during school holidays. If both options are rated by a child, higher of the two scores is included in the total CDLQI score. Answers are scored on a 4-point scale from 0 (not at all) to 3 (very much). The CDLQI total score is calculated by summing the score of

each question (0–3) resulting in a minimum of 0 and a maximum of 30. The higher the score, the more QoL is impaired. Serbian version of CDLQI has been validated previously.²¹ The severity banding of total CDLQI score is suggested as follows: 0 to 1 – no effect; 2 to 6 – small effect; 7 to 12 – moderate effect; 13 to 18 – very large effect and 19 to 30 – extremely large effect of AD on child's life.²²

Statistical analysis

Descriptive statistics were used to describe the cohort of children. Continuous variables were presented as mean ± SD, and categorical values as frequencies and percentages. To assess differences between variables in boys and girls, Hi square test and Student's t-test were used where appropriate. Correlation between CDLQI scores and AD severity (TIS score) was assessed using Pearson's correlation coefficients. Multivariate logistic regression analyses were performed with gender as dependent variable and age, concomitant atopic disease, diseases severity (TIS score), CDLQI overall score and family history of disease as independent variables. Cronbach's alpha was applied to assess the reliability of CDLQI. A two-tailed probability value of 0.05 or less was considered significant. All statistical analyses were performed with the Statistical Package for the Social Sciences (SPSS), version 20.0 for Windows (SPSS Inc., Chicago, IL, USA).

RESULTS

Socio-demographic and clinical characteristics of the study sample (n = 200) according to gender are presented in Table 1. There were no significant differences between boys (78) and girls (122) in mean age, concomitant atopic disease, family history of atopic diseases, and diseases severity.

The overall CDLQI score and scores for all 10 items of CDLQI according to gender are shown in Table 2. The mean CDLQI score of the total sample was 17.11 ± 5.89. The difference in overall CDLQI between boys and girls was not statistically significant (P = 0.217). Overall, the domains that were most affected by AD were school/holidays (mean score 2.27 ± 0.65), symptoms (mean score 2.22 ± 0.70), followed by friendships (1.86 ± 0.85) and leisure/hob-

Table 1: Characteristics of the study sample according to gender

Characteristic	All	Boys	Girls	<i>P</i>
Total sample	200 (100)	78 (39.0)	122 (61.0)	
Age				
Range	5–16	5–16	6–16	
Mean ± SD	11.68 ± 2.73	11.74±2.54	11.64±2.86	0.793*
Atopy				
AD alone	78 (39.0)	34 (43.6)	44 (36.1)	0.287**
AD and atopic disease	122 (61.0)	44 (56.4)	78 (63.9)	
Family history of atopic disease				
Yes	155 (77.5)	56 (71.8)	99 (81.1)	0.122**
NO	45 (22.5)	22 (28.2)	23 (18.9)	
Disease severity, n (%)				
TIS (mean ± SD)	5.10 ± 0.90	5.00±0.88	5.16±0.91	0.211*
Mild (TIS = 0–2)	/	/	/	
Mild (TIS = 0–2)	164 (82.0)	66 (84.6)	98 (80.3)	0.441**
Severe (TIS ≥ 6)	36 (18.0)	12 (15.4)	24 (19.7)	

* t-test; ** χ^2 test

AD – atopic dermatitis; Atopic disease – asthma, allergic rhinitis, and/or allergic conjunctivitis; SD – Standard deviation; TIS – Three-Item Severity score.

Table 2: The Children's Dermatology Life Quality Index (CDLQI) according to gender

CDLQI (mean ± SD)	All (n = 200)	Boys (n = 78)	Girls (n = 122)	<i>P</i> *
Total score	17.11 ± 5.89	16.20 ± 5.94	17.70 ± 5.80	0.217
1. Symptoms	2.22 ± 0.70	2.18 ± 0.72	2.25 ± 0.70	0.516
2. Feelings	1.61 ± 1.11	1.54 ± 1.09	1.65 ± 1.13	0.492
3. Friendship	1.86 ± 0.85	1.90 ± 0.81	1.84 ± 0.87	0.620
4. Clothes/shoes	1.59 ± 0.89	1.67 ± 0.92	1.54 ± 0.86	0.329
5. Leisure/hobbies	1.86 ± 0.80	1.72 ± 0.85	1.95 ± 0.76	0.051
6. Swimming/sports	1.56 ± 1.04	1.36 ± 1.13	1.69 ± 0.97	0.035
7. School/holidays	2.27 ± 0.65	2.13 ± 0.69	2.36 ± 0.60	0.013
8. Teasing/bullying	1.68 ± 0.80	1.44 ± 0.85	1.84 ± 0.73	0.001
9. Sleep	1.20 ± 0.85	1.03 ± 0.90	1.31 ± 0.80	0.020
10. Treatment	1.28 ± 0.72	1.26 ± 0.75	1.29 ± 0.71	0.714

* t-test **Bold** values stand for statistical significance.**Table 3:** Distribution of the overall CDLQI scores of boys and girls with AD according to the CDLQI banding

CDLQI score	Total N (%)	Boys N (%)	Girls N (%)	<i>p</i>
No effect (0–1)	/	/	/	
Small effect (2–6)	4 (2.0)	4 (5.1)	/	
Moderate effect (7–12)	44 (22.2)	22 (28.2)	22 (18.3)	0.009
Very large effect (13–18)	64 (32.3)	18 (23.1)	46 (38.3)	
Extremely large effect (19–30)	86 (43.4)	34 (43.6)	52 (43.3)	

bies (1.86 ± 0.80). Swimming/sports activities, school/holidays, teasing/bullying and sleep disturbances were more affected in girls (Table 2). Statistically significant difference in distribution of the overall CDLQI scores of boys and girls

with AD according to the CDLQI banding is presented in Table 3. The effect of AD was more likely to be moderate in boys and very large in girls (*p* = 0.009).

Table 4: Correlation between CDLQI scores with AD severity (TIS score)

CDLQI score	Boys Coefficient *	<i>p</i>	Girls Coefficient *	<i>p</i>
Overall CDLQI	0.39	<0.001	0.62	<0.001
Symptoms and feelings (questions 1 and 2)	0.37	0.001	0.53	<0.001
Leisure (questions 4, 5 and 6)	0.27	0.018	0.49	<0.001
School/holidays (question 7)	0.08	0.458	0.37	<0.001
Personal Relationships (questions 3 and 8)	0.46	<0.001	0.47	<0.001
Sleep (question 9)	0.20	0.084	0.49	<0.001
Treatment (question 10)	0.35	0.001	0.53	<0.001

CDLQI – Children's Dermatology Life Quality Index

*Pearson's correlation coefficient. TIS – Three-item severity score; AD – Atopic dermatitis.

Bold values stand for statistical significance.

Overall CDLQI score and CDLQI subscale scores (except school/holidays and sleep in boys) significantly correlated with TIS (Table 4). In comparison with boys, stronger correlation was seen in girls for overall CDLQI score ($r = 0.62$ for girls and $r = 0.39$ for boys) and CDLQI subscale scores. However, CDLQI overall score did not correlated significantly with the age of boys and girls ($r = -0.09$, $p = 0.411$ for boys and $r = -0.10$, $p = 0.271$ for girls).

DISCUSSION

In this study the difference in overall CDLQI score between boys and girls was not significant ($P = 0.217$) that is in agreement with the results of previous studies.^{15,16} The international multi-centre study on self-assessed QoL in 167 AD non-matched children, 5–16 years old, from Ukraine, Czech Republic, Singapore, and Italy did not find any significant gender differences between boys and girls in CDLQI results.¹⁵ In the matched analysis of the same international study in which each child in the group of boys ($N = 36$) was matched to a corresponding child in the group of girls ($N = 36$) from the same country whose age and SCORAD value were almost identical, Chernyshov et al. did not find differences in overall CDLQI.¹⁶ On the contrary, Kiebert et al. found a significant gender difference in QoL of older children with AD with significantly higher CDLQI scores in girls.¹⁰

In the present study girls with AD in comparison with boys, assessed CDLQI on swimming/sports, school/holidays, teasing/bullying and

According to multivariate logistic regression analyses statistically significant differences between two genders were not found for age, AD severity measured by TIS, concomitant atopic disease, and family history of atopic disease (data not shown).

The good internal consistency of the CDLQI was demonstrated with a Cronbach's alpha coefficient of 0.88.

sleep significantly higher. However, we did not find statistically significant differences between the two genders in the CDLQI subscale symptoms and feeling that is in contrast with the study conducted by Balci et al.²³ In the matched study by Chernyshov et al. the CDLQI subscale on symptoms and feeling was assessed significantly higher by girls with AD. A gender difference was found for the item feelings while there was no gender difference in the assessment of the item symptoms. Girls were more embarrassed, self-conscious, upset and sad because of AD.¹⁶ Like Chernyshov et al. we did not find gender differences in problems with issues of clothes and shoes (changing and wearing different and special clothes or shoes because of child's skin).¹⁶ In contrast, Hon et al. reported that girls had more problems with clothes and shoes than did boys.¹²

In our study overall CDLQI score correlated well with disease severity that is in accordance with previous studies.^{9, 15, 16, 24-26} Besides the overall CDLQI score, the CDLQI subscale scores on

symptoms and feelings, leisure, personal relationships, and treatment correlated well with disease severity in both genders, while significant correlation on school/holidays and sleep was found only in girls. In comparison with boys, stronger correlation was seen in girls for overall CDLQI score ($r = 0.62$ vs. $r = 0.39$) and all CDLQI subscale scores. In the matched study conducted by Chernyshov et al.¹⁶ two separate items in boys (symptoms and feelings) and five items in girls (symptoms, feelings, friendship, playing and doing hobbies, and swimming) significantly correlated with AD severity. In our study the CDLQI item on problems with swimming and other sports was the sixth highly scored item in girls. In the study by Ang et al.²⁷ this item was the second highly scored item, and one of the lowest scored items in the study by Chernyshov et al.¹⁶

To the best of our knowledge this is one of a few studies on gender differences of QoL in children with AD in Western Balkan with relatively high number of patients. However, some limitations of the present study should be mentioned. First, only children with moderate to severe forms of AD were enrolled in the study. The reason is that the most severe forms of AD are treated at the CCM, a tertiary health care center. Because of

that it is not possible to generalize the results of our study to other patients affected by AD in the population of Montenegro. Second, like most authors, we did not apply matching in the analysis, although it has been recommended that gender differences can be adequately studied only if the children in the girls' and boys' groups were individually matched across groups for age and severity of AD.¹³

Although we did not find differences between the two genders in the overall health-related QoL, we confirmed the tendency for AD to have a more severe impact on girls' lives. For example, swimming/sports activities, school/holidays activities, teasing/bullying and sleep disturbance were more affected by girls. Symptoms, such as itching, scratching and pain and feeling such as embarrassment or self-conscious, upset or sad, were increased with AD disease severity in both genders, especially in girls who in general need more attention to their AD-related psychological problems. These results may influence treatment and counselling of children affected with AD. Doctors should focus on the prevention of avoidance behaviour in girls who have more severe AD, because such avoidance behaviour may affect other domains of girls' lives, like friendships, hobbies, sports, and even school work.

ACKNOWLEDGMENTS

This study was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia, Project No. 175025. We thank Professor Andrew Finlay, and Dr. Mohammad Basra, Department of Dermatology and Wound Healing, Cardiff University School of Medicine, Cardiff, UK, for the formal

permission to translate and use the CDLQI in this study.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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