

Report

Gender differences in health-related and family quality of life in young children with atopic dermatitis

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Abstract

Background Atopic dermatitis (AD) has an established impact on health-related quality of life (HRQoL) and family QoL.

Objectives This study was designed to investigate gender differences in health-related and family QoL in children with AD.

Methods Cohorts of 25 girls and 25 boys with AD aged <4 years were selected from 102 children with AD. Children in the girls' and boys' groups were individually matched across groups for age and severity of AD according to their scores on the SCORAD Index (SCORing of Atopic Dermatitis). The children's parents filled in the Infants' Dermatitis Quality of Life (IDQoL) Index and the Dermatitis Family Impact (DFI) questionnaires.

Results The impact of AD on QoL ($P < 0.05$) and family QoL ($P < 0.05$) was more severe in girls. The severity of AD as assessed by the parents was equal in both groups. More parents of girls reported that AD impacted on the "child's mood" ($P < 0.05$) and "enjoying family activity" ($P < 0.05$). "Child's mood" and "sleep disturbance" were highly scored by parents of girls ($P = 0.01$ and $P < 0.05$, respectively). Severity of AD as assessed by parents and IDQoL Index scores correlated with SCORAD scores in both groups. Scores on the DFI correlated with patient age in boys. The child's age correlated with the emotional distress of parents in both groups and had an impact on "relationships in the family" in girls only. Several DFI items and overall family QoL correlated with patient age in boys.

Conclusions The impact of AD on QoL and family QoL was more severe for girls. Relationships between parents progressively worsen with patient age in girls. Reported gender differences should be further investigated and may influence educational programs and advice given to parents of children with AD.

Introduction

Atopic dermatitis (AD) has a well-established impact on health-related quality of life (HRQoL) and family QoL.^{1–3}

No difference in HRQoL was found between adult men and women with AD using the Dermatology Life Quality Index (DLQI)^{4,5} and the 36-item Short-Form Health Survey (SF-36).⁴ However, a gender difference in adult AD patients was found on the mental component of the SF-36.⁶ For women, significant positive correlations emerged between DLQI score and disease severity and also between DLQI score and visible regions affected by disease; these correlations were not observed in men. A significant correlation between total number of body regions affected and severity was found for women but not for men.⁵

A study in children with AD aged 5–16 years using the Children's Dermatology Life Quality Index (CDLQI) found minimal differences between the genders.⁷ Girls

were found to have more problems than boys concerning clothes and shoes.⁷

Are there any gender differences in HRQoL and family QoL in younger children with AD?

The techniques used to measure QoL are questionnaire-based. However, when a target group of patients, such as infants, cannot perform a self-rating, outsider ratings (proxy ratings) can be used. These are usually required in studies in young children. The Infants' Dermatitis Quality of Life (IDQoL) Index is designed for use in infants with AD aged <4 years. The severity of eczema is scored separately by the child's parents or regular caregiver.⁸ Skin disease in an individual often has a secondary impact on the lives of that person's family. The Dermatitis Family Impact (DFI) questionnaire was designed to examine this secondary effect of skin disease.⁹

The gender of the parent who completes the IDQoL Index^{10,11} and the DFI¹¹ has been shown not to significantly influence the results.

Gånemo *et al.*¹² were unable to detect any significant gender difference in HRQoL and family QoL scores of AD children using the IDQoL Index and DFI questionnaires. Their study included 28 children with AD (16 boys, 12 girls) aged 2–4 years, but their sample was not randomized for disease severity or age.¹²

The present study investigated gender differences in HRQoL and family QoL in randomized children with AD aged <4 years.

Materials and methods

Subjects

The sample in this study was drawn from 102 children with AD aged <4 years. The diagnosis of AD was made using the criteria of Hanifin and Rajka.¹³ Disease severity was estimated by the same dermatologist using the SCORAD Index (SCORing of Atopic Dermatitis).¹⁴ Patients were required to have no health problems other than AD in order to be included in the study. Patients were divided into two groups based on their sex and randomized according to age in months and SCORAD values. Each child in the group of boys was matched to a corresponding child in the group of girls whose age in months and SCORAD value were almost identical. Thus, 25 girls and 25 boys with AD were selected for further investigation. The mean age of the girls was 21.40 ± 11.26 months (range: 9–48 months). The mean age of the boys was 21.08 ± 10.48 months (range: 10–48 months). The mean SCORAD value in the girls' group was 23.0 ± 11.8 (range: 3.4–43.0). The mean SCORAD value in the boys' group was 23.0 ± 12.2 (range: 3.9–44.4). The parents of all children selected reported that onset of AD had occurred in their children during the first two months of life.

Quality of life assessment

Parents of all children were asked to estimate AD severity and its influence on the HRQoL of their child and on their family QoL by completing the Ukrainian versions of the IDQoL Index and the DFI questionnaire, respectively. The IDQoL Index consists of 10 questions scored on a range of 0–3 for a maximum score of 30. It also contains a single initial item asking for a parental assessment of global clinical severity, which is scored separately on a range of 0–4 (from none to extremely severe).⁸ The DFI consists of 10 questions scored on a range of 0–3 for a maximum score of 30.⁹ Original versions of the IDQoL Index and DFI questionnaire were translated into Ukrainian by two independent translators and then back-translated into English by two other independent translators. Final back translation was confirmed by one of the IDQoL Index and DFI authors and copyright owner, Professor A. Y. Finlay. Retest reliability, discriminant validity, over-time sensitivity, and sensitivity to successful therapeutic intervention were checked.¹⁵ Ethical permission for the study was granted by the

local research ethics committee. Signed informed consent forms were received from parents.

Statistical methods

Data were presented as mean $\pm$ standard deviation of the mean. Unpaired *t*-test with Welch correction (two-tailed *P*-value), Fisher's exact test (two-sided), and non-parametric correlation (Spearman's *r*) were used. The results were considered significant if $P < 0.05$.

Results

Significant gender differences in overall IDQoL Index and DFI scores were found (Fig. 1). According to our data, AD had greater impact on HRQoL ($P < 0.05$) and family QoL ($P < 0.05$) in the girls' group. However, AD severity as assessed by parents was almost equal in both groups (Fig. 2). Scores for the IDQoL Index item on impact on the "child's mood" showed a significant gender difference (1.08 ± 0.41 for girls, 0.71 ± 0.55 for boys; $P = 0.01$). Atopic dermatitis also had more severe impact on "sleep disturbance" in girls although at a minimal level of statistical significance (0.54 ± 0.93 for girls, 0.13 ± 0.34 for boys; $P < 0.05$). The difference in scores on the "enjoying family activity" item on the IDQoL Index almost reached statistical significance (0.92 ± 0.72 for girls, 0.50 ± 0.78 for boys; $P = 0.06$).

On the DFI, the only item for which a gender difference in scores almost reached statistical significance was that on "effect of the child having eczema on emotional distress" (1.28 ± 0.74 for girls, 0.84 ± 0.90 for boys; $P = 0.06$).

In terms of numbers, significantly more parents of girls reported a negative impact of AD on their "child's mood" (girls' parents: $n = 23$; boys' parents: $n = 16$; $P < 0.05$) and "enjoying family activity" (girls' parents: $n = 17$; boys' parents: $n = 9$; $P < 0.05$). The number of

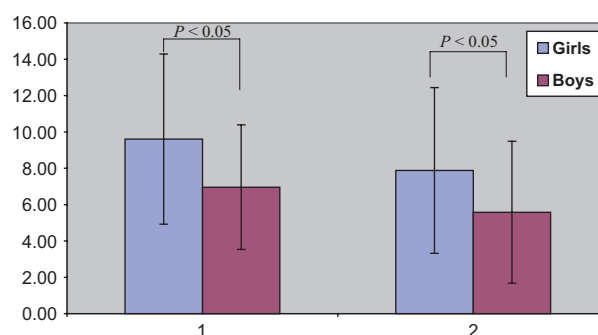


Figure 1 Mean Dermatitis Family Impact (DFI) and Infants' Dermatitis Quality of Life (IDQoL) Index data for boys ($n = 25$) and girls ($n = 25$) with atopic dermatitis

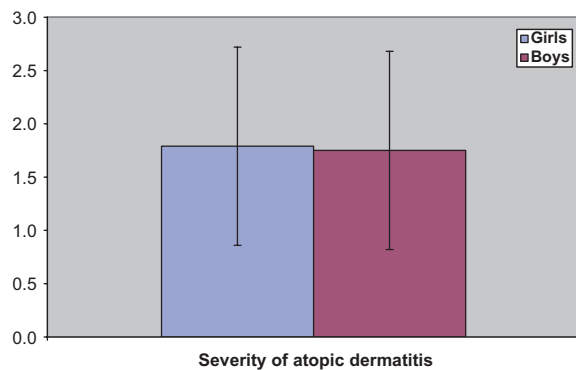


Figure 2 Severity of atopic dermatitis (AD) assessed by the parents of boys ($n = 25$) and girls ($n = 25$) with AD

girls' parents who reported an "effect of the child having eczema on emotional distress" was not quite significantly higher than the respective number of boys' parents (girls' parents: $n = 22$; boys' parents: $n = 15$; $P = 0.05$).

The severity of AD as assessed by parents and overall IDQoL Index scores correlated significantly with SCORAD value and not significantly with patient age in both groups. Overall DFI scores correlated significantly with patient age in boys and not significantly in girls. No significant correlation of SCORAD value with overall DFI scores was reported (Table 1). Scores on five separate items on the IDQoL Index significantly correlated with SCORAD values in the boys' group: "itching and scratching" ($r = 0.62$, $P < 0.01$); "child's mood" ($r = 0.45$, $P < 0.05$); "playing or swimming" ($r = 0.41$, $P < 0.05$); "uncomfortable dressing" ($r = 0.48$, $P < 0.05$); and "problems at bathtime" ($r = 0.45$, $P < 0.05$). Two items correlated with patient age: "child's mood" ($r = 0.41$, $P < 0.05$) and "playing or swimming" ($r = 0.50$, $P < 0.05$). Only two IDQoL Index items significantly correlated with SCORAD values in the girls' group: "itching

and scratching" ($r = 0.44$, $P < 0.05$) and "uncomfortable dressing" ($r = 0.45$, $P < 0.05$). Two other items correlated with patient age: "enjoying family activity" ($r = 0.49$, $P < 0.05$) and "problems at mealtimes" ($r = 0.44$, $P < 0.05$). In the girls' group, only one DFI item significantly correlated with SCORAD score: "sleep of others in family" ($r = 0.43$, $P < 0.05$). Also in the girls' group, two DFI items correlated with patient age: "having emotional distress" ($r = 0.42$, $P < 0.05$) and "effect on relationships in family" ($r = 0.55$, $P < 0.01$). In the boys' group, two DFI items significantly correlated with SCORAD value: "sleep of others in family" ($r = 0.41$, $P < 0.05$) and "expenditure" ($r = 0.19$, $P < 0.05$). In the boys' group, five DFI items correlated with patient age: "food preparation/feeding" ($r = 0.67$, $P < 0.001$); "family leisure activity" ($r = 0.43$, $P < 0.05$); "time spent on shopping" ($r = 0.53$, $P < 0.01$); "expenditure" ($r = 0.41$, $P < 0.05$) and "having emotional distress" ($r = 0.40$, $P < 0.05$).

Discussion

To the best of our knowledge, this is the first randomized study to report significant gender differences in HRQoL and family QoL in children with AD. Although previously published data on the presence of gender differences in QoL in children with AD are lacking, Svavarsdottir *et al.*¹⁶ reported that parents of boys with asthma, another atopic disease, perceived their child's QoL more positively compared with parents of girls. No gender difference in the severity of asthma was found.¹⁶

Almost all studies that have used the IDQoL Index have found the child's mood to have one of the highest negative impacts on QoL in AD children.^{8,12,17,18} The present investigation found a prominent gender difference in the impact of AD on the child's mood. According to Ricci *et al.*,¹⁷ parents perceive their child's mood with great sensitivity and attention and are able to sense small alterations and changes in the child's mood and everyday activities. However, feelings of exhaustion and depression in parents can sometimes alter this perception and lead to a slight overrating in their assessment.¹⁷ Atopic dermatitis almost always affects the face and other visible parts of the skin in young children. In adult AD patients, QoL has been shown to be significantly correlated with the quantity of visible regions affected by disease in women but not in men.⁵ In general, adult female dermatology patients are more distressed than male dermatology patients.¹⁹ It is likely that the presence of AD lesions on the visible parts of girls' skin causes more problems for parents than equivalent lesions on boys' skin because they think it is more important for girls to have healthy-looking facial skin. In the present study, more parents of girls were found to be distressed, and this type of distress may

Table 1 Correlations (Spearman's r) of atopic dermatitis (AD) severity as assessed by parents and overall scores on the Infants' Dermatitis Quality of Life (IDQoL) Index and the Dermatitis Family Impact (DFI) questionnaire with SCORAD values and age of children with AD

	SCORAD value		Age, months	
	Girls ($n = 25$)	Boys ($n = 25$)	Girls ($n = 25$)	Boys ($n = 25$)
AD severity as assessed by parents	$r = 0.41$ $P < 0.05$	$r = 0.41$ $P < 0.05$	$r = -0.15$ $P = 0.48$	$r = 0.14$ $P = 0.51$
IDQoL Index score	$r = 0.44$ $P < 0.05$	$r = 0.58$ $P < 0.01$	$r = -0.38$ $P = 0.07$	$r = 0.33$ $P = 0.12$
DFI score	$r = 0.05$ $P = 0.74$	$r = 0.21$ $P = 0.32$	$r = 0.32$ $P = 0.12$	$r = 0.50$ $P < 0.05$

influence their child's mood directly or impact the parent's assessment of the child's mood.

It has been shown that sleep is significantly compromised in patients with AD according to severity, but the subjective scoring of the quality of sleep by parents showed only limited correlation with an objective actigraphy method.²⁰ Based on CDLQI results, Hon *et al.*⁷ reported that sleep disturbance affected both genders similarly in children aged >4 years. A significant correlation between itch and sleeplessness has been well documented in large studies.²¹ Gender differences in the intensity of pruritus have not been well studied. However, Green *et al.*²² demonstrated significant sex differences in pruritogen-induced scratching behavior in a mouse model, with female mice scratching an average of 23% more than males. Therefore, the significant gender difference in sleep disturbance reported in our study may be explained by the higher sensitivity of girls to AD symptoms, as well as by the subjectivism of parental assessment.

Surprisingly, more parents of small girls reported a negative impact of AD on "enjoying family activity". It may be that girls are more involved in family activities from a very early age. This may be explained by both gender differences and the tendency of girls to mature faster. Therefore, even a small negative influence of AD on girls' ability to take part in family activities is more noticeable.

The severity of AD showed poor correlations with family QoL. Only the DFI item on "sleep of others in family" significantly correlated with the clinical severity of AD according to SCORAD values in both groups.

Higher age in the child and thus longer duration of AD was associated with an increase in emotional distress in parents, irrespective of the patient's gender, but only in the girls' group did higher age have severe impact on "relationships in the family". However, several other DFI items and overall family QoL significantly correlated with patient age in the boys' group. Thus, the older the boy, the greater the impact of AD on different aspects of his family's QoL. Although behavioral problems and parental distress are important features of severe atopic eczema in early childhood, Daud and colleagues²³ reported that atopic eczema does not diminish the security of the mother-child attachment. The impact of AD on relationships between the parents of girls, which, in the present study, correlated well with patient age, can cause parents to separate or divorce. This may worsen the clinical course of AD in their daughters because divorce and separation are associated with a significantly increased incidence of AD in children.²⁴

This study shows that AD has significantly greater impact on the HRQoL and family QoL of girls than boys. Parents of girls consider any imperfection of their daughter's skin to represent a severe problem from a very early age. It may be that the parents of girls with AD carry an

expectation that the disease will cause severe problems for their daughter in the future. This may explain why relationships between parents of girls worsen with increasing patient age. Similarly, the impact of AD on parents of boys and changes in their lifestyle (in terms of food preparation, family leisure activities, time spent on shopping, expenditure) increases progressively with the age of their sons.

Reported gender differences should be further investigated and may influence educational programs and the advice given to parents of small children with AD.

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