Initial validation of the epidermolysis bullosa-specific module of the Infants and Toddlers Dermatology Quality of Life (InToDermQoL) questionnaire

Running head: Quimp in epidermolysis bullosa

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Abstract

Children with epidermolysis bullosa (EB) experienced the highest quality of life impact among several skin conditions and have problems which had not been reported by parents of children with other skin diseases. The EB-specific module of the Infants and Toddlers Dermatology Quality of Life (InToDermQoL) questionnaire was recently developed to measure the impact of disease-specific aspects in children from birth to the age of four years. The aim of this study was initial validation of the InToDermQoL-EB questionnaire. Parents of 44 children with EB from seven countries completed the InToDermQoL-EB questionnaire. Cronbach's alpha was 0.86, 0.89 and 0.91 for three age-specific versions. Differences between severity levels were all significant except for that between moderate and severe level in the version for 3-4 years old children. All items of the three versions of the InToDermQoL-EB showed very high levels of relevance except "problems with defecation" in children under one year of age and "rejection by other children" in 3-4 years old children. The three versions of the InToDermQoL-EB instrument showed good internal consistency and discriminated well between different severity levels. All InToDermQoL-EB items were confirmed as being of high relevance and the questionnaire may be used in practice and clinical trials.

Key words:

Epidermolysis bullosa, paediatric dermatology, quality of life

Introduction

Use of the Infants and Toddlers Dermatology Quality of Life (InToDermQoL), a dermatology-specific proxy health-related quality of life (HRQoL) instrument for 0-4 years old children, has shown that children with epidermolysis bullosa (EB) experienced the highest quality of life impact among several skin conditions.[1] During focus group discussions, disease-specific problems were revealed which had not been reported by parents of children with other skin diseases.[2] A recent systematic review on QoL in EB showed that children with EB suffered more than adults and concluded that future studies should use standardized specific instruments to assess QoL in EB patients, considering the particularities of different age groups.[3] Proxy ratings can be used to assess HRQoL in very young children.[4]

The EB-specific module of the InToDermQoL questionnaire was recently developed to measure the impact of disease-specific aspects in children from birth to the age of four years.[5] International pilot tests confirmed that there was no need to modify the instrument's items. In the debriefing sessions, all three age-related versions of the InToDermQoL-EB showed good comprehensibility, clarity and acceptance.[6] The data resulting from HRQoL assessment may be used for several different purposes[7] but only if the evaluation instruments are appropriately validated. The aim of this study was initial validation of the InToDermQoL-EB questionnaire.

Methods and Materials

The InToDermQoL-EB consists of three versions, addressed to different age groups: 11 items for children <1 year of age, 14 items for 1-2 years old children and 17 items for 3–4 years old children. Responses to the InToDermQoL EB module are on a 4-point scale, scored from 0 to 3. The total score is calculated by summing the score of each question. The maximum total score for children <1 year of age is 33, for 1-2 years old children is 42 and for 3-4 years old children is

51. The recall period of the InToDermQoL-EB module is one week.[5] In order to evaluate the validity of the questionnaire, parents or other adult relatives of children with EB aged from birth to 4 years old were asked to fill in the questionnaires in Spain, Bulgaria, Croatia, Greece, Romania, Serbia and Ukraine. Median total scores and interquartile range were calculated for each version overall and according to sex and severity. Scores were compared using the non-parametric Mann-Whitney test. Internal consistency was measured using the Cronbach's alpha. Discriminant validity was assessed by the ability to discriminate among different severity grades.

The EADV TF on QoL and Patient Oriented Outcomes recommends using the word "quimp"[8] (quality of life impairment) in routine clinical work and research[9] and the word has been used in this article. The study was approved by local ethics committees.

Results

Parents of 44 children (68.2% boys) with EB completed the national language versions of the InToDermQoL-EB questionnaire (10 parents of children less than one year of age, 16 parents of 1-2 years old children and 18 parents of 3-4 years old children). Cronbach's alpha was 0.86 for the version for children less than one year of age, 0.89 for the version for 1-2 year olds, and 0.91 for 3-4 year olds. Scores in boys and girls were not significantly different, while the median scores were significantly higher with increased disease severity. Differences between severity levels were all significant except for that between moderate and severe level in the version for 3-4 years old children (Table 1). All items of the three versions of the InToDermQoL-EB showed very high levels of relevance except "problems with defecation" in children under one year of age (30%) and "rejection by other children" in 3-4 years old children (38.89%). Mean values for separate InToDermQoL-EB items are presented in Figure 1.

Discussion

The InToDermQoL-EB showed good internal consistency and discriminated well among different EB severity levels. The high frequency of all items being scored indicated a severe negative impact of EB on different aspects of life and confirmed the relevance of the InToDermQoL-EB questionnaire's items. Prevalence of rejection by other children was relatively low in our study, but it might have been higher in preadolescence and adolescence, associated with ongoing psychosocial development.[10]

Pain is a well-known symptom in EB patients.[11] In our study from 70% to almost 90% of parents reported pain in their children with EB. In the study by Snauwaert et al.[12] itch occurred in 85% of the patients, with substantial differences across EB subtypes. Prevalence of itch in our study was from 50% to 100% in different age groups. It is possible that mild itch may be underestimated by parents of youngest children. Bleeding had significant impact on quimp in 72.2% -87.5% of included children with EB. Meanwhile, items on bleeding are absent in most dermatology-specific HRQoL instruments and in an EB-specific instrument for adults and older children. Problems with physical and daily activities and psychological problems are also well described in previous studies on EB[11,13] but our data underlined the importance of providing psychological help for children as young as three years old.

The main limitation of this study was the low number of patients, making validation within different EB types impossible. The total number of children with EB in most countries is low. For example, the prevalence rate of recessive dystrophic EB in Serbia is approximately 5 per 1,000,000 of general population and there are only 4 patients with recessive dystrophic EB younger than 4 years old in the whole country. It is therefore not possible to perform valid

statistic comparison of EB-module scores between all countries. However, even where total QoL scores in patients from different countries are similar, there may be significant differences in individual QoL item scores.[14] For reliable studies on gender differences patients should be thoroughly matched by age and disease severity[15] and EB types, as in our case. Therefore, tasks for future studies include comparison of quimp between different EB-types and between countries , along with assessment of gender differences.

Conclusion

The three versions of the InToDermQoL-EB instrument showed good internal consistency and discriminated well between different severity levels. All InToDermQoL-EB items were confirmed as being of high relevance and the questionnaire may be used in practice and clinical trials.

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Age groups	**Children from birth to one year old**			**Children from 1 to <3 years old**			**Children from 3 to 4 years old**		
	N (%)	**Median IQ range**	**P-value***	**N (%)**	**Median IQ range**	**P-value***	**N (%)**	**Median IQ range**	**P-value***
Sex									
Boys	9 (90.0)	8.0 6.0-16.0		8 (50.0)	19.0 14.0-33.5		13 (72.2)	23.0 13.5-32.0	
Girls	1 (10.0)	11.0 11.0-11.0	0.72	8 (50.0)	20.5 14.2-24.7	0.83	5 (27.8)	17.0 13.0-31.5	0.82
Severity									
Mild	5 (50.0)	8.0 3.0-9.5		5 (31.2)	13.0 7.5-18.5		8 (44.4)	13.5 8.7-16.5	
Moderate	5 (50.0)	14.0 9.5-18.5		7 (43.8)	19.0 18.0-22.0		4 (22.2)	22.5 17.2-32.2	
Severe	0 (0.0)	---	0.03 Mild-Moderate	4 (25.0)	32.0 29.0-37.2	0.06 Mild-Moderate 0.01 Moderate-Severe 0.01 Mild-Severe	6 (33.4)	32.5 26.5-36.2	0.02 Mild-Moderate 0.11 Moderate-Severe <0.01 Mild-Severe

IQ=interquartile

*From Mann-Whitney U test

Table 1. Median total scores of the three versions of the InToDermQoL-EB questionnaire according to sex and EB severity

Figure 1. Mean values for separate InToDermQoL-EB items