Quality of Life in Children and Families With Bleeding Disorders

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Summary: Quality of life (QoL) in children and adolescents with bleeding disorders and their families is a relatively new topic. It is important to understand more about QoL in this patient population to evaluate and if necessary to improve the care patients receive. To achieve this aim, a questionnaire to assess patients' QoL in hemophilia was developed and psychometrically tested. Three hundred twenty hemophiliac children and adolescents from six European countries and their families were asked to fill out a questionnaire regarding different aspects of their well-being and functioning, as well as their views on hemophilia care. Generic QoL questionnaires showed that children with hemophilia have a higher QoL than other patients with chronic disease, such as asthma/atopic dermatitis and obesity. Several determinants affected patients' QoL (e.g., number of bleeds, social support). Parents' and children's assessments differed with regard to social and emotional aspects of QoL. The study showed that variations in QoL can be explained by clinical and psychosocial factors and suggested that QoL can be assessed and enhanced both by medical and non-medical (e.g., psychological) interventions.

Key Words: quality of life, assessment, hemophilia, children, families, social support

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In pediatrics, the issue of quality of life (QoL) is considered an important indicator of the outcome of treatments that refers to patient-perceived well-being and functioning.[1] Consequently, interest in measuring QoL as an end point in clinical trials of hematologic treatments has been voiced. The QoL concept can be also applied to the question of how persons with bleeding disorders rate their QoL in comparison to persons with other chronic conditions or to healthy persons. In addition, health economic studies may use QoL as an indicator of the benefit and utility of certain interventions. Moreover, research on QoL is also an issue in clinical practice. Physicians may be interested in assessing the QoL of their patients to monitor and evaluate their well-being and functioning. On the institutional level, clinical documentation may thus be complemented by QoL data.[2]

Despite the recent interest in this topic, QoL assessment in pediatric hematology is still rare and pertains mostly to adults.[3] One reason might be that in contrast to measuring QoL in adults, children's views seem difficult to assess. In fact, it is assumed that it is difficult for children, especially younger ones, to reliably and validly express their feelings and behaviors. Another issue is which domains of QoL in children might be appropriate, and how children's and parents' views are related. In the past 5 years an increasing effort has been made in the field of QoL to assess well-being and functioning in children. Review articles have addressed theoretical and conceptual but also methodical and practical issues of measuring QoL.[4] For several age groups, generic (e.g., the Child Health Questionnaire[5] or the KINDL[6]) as well as disease-specific (e.g., diabetes and atopic dermatitis[7]) measurements have been developed. However, QoL assessment in children and adolescents with bleeding disorders, specifically hemophilia, has only recently been addressed.

The issue of QoL has been implicitly touched on in several publications dealing with coping, adaptation, and development in children with hemophilia, but was not directly measured.[8] QoL is an especially important issue in evaluating the outcome of treatment strategies, such as prophylactic or on-demand treatment.[9] The current study, conducted in six European countries, had as its objective to develop and test a disease-specific measurement for QoL in children with hemophilia. While development and pilot testing have been published[10] and psychometric results of the field test have been submitted,[11] the current paper aims to identify clinical and psychosocial determinants of children's QoL.

METHODS

In the field study, male children and adolescents with hemophilia from six European countries (Germany, Italy, France, Spain, UK, Netherlands) as well as their parents were included after informed consent was given. Patient filled in a

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questionnaire containing several measurements, among with the new disease-specific Haemo-QoL questionnaire,[10] the generic KINDL[6] questionnaire, as well as measurements related to locus of control, coping, social support, and perceived hemophilia care. For the Haemo-QoL three different age-group versions exist (I, 4–7 years; II, 8–12 years; III, 13–16 years). Parents filled out a similar questionnaire and were asked to judge their children's QoL and also to give information about their own QoL as well as their perception of hemophilia and its care. A total of 339 patients and 330 parents participated in this study. Questionnaires were administered in the clinics and data were inputted, controlled, and processed using a databank system. Statistical analysis contained descriptive and inferential statistics (e.g., *t* tests). Multiple regression was carried out to evaluate the contribution of different predictors of QoL. The current regression analysis included patients aged 8 to 16 years, since younger patients filled in a reduced questionnaire version that did not include the assessment of psychosocial determinants.

RESULTS

Sociodemographic data were available for 320 children, 225 of them in the older age groups. The mean age was 10.00 (SD 3.7) years. Most of the children had one sibling.

For the generic QoL (KINDL) measures, the values of the dimensions were transformed (0 and 100), with 100 representing the highest score in QoL, so that we could compare the answer pattern across the conditions.

In comparison to other chronic diseases, children with hemophilia reported a higher QoL in all dimensions of the generic KINDL questionnaire except the dimension "school" (Table 1). They reported a higher QoL in the dimension "chronic disease" (i.e., less perceived impairment) compared to the other populations. The disease-specific Haemo-QoL questionnaire consists of 8 to 12 dimensions of QoL, based on the different age groups (I, 8 dimensions; II, 10 dimensions; III, 12 dimensions). Means and standard deviation of children's as well as parents' ratings (raw scores: high values implying higher impairment) of the Haemo-QoL dimensions are shown in Table 2. Patients showed relatively low impairments in QoL, with a mean of 23.12 for age group 1, 20.92 for age group II, and 24.02 for age group III. Parents overestimated problems in some aspects compared with their children. Significant difference between parents' and patients' views are marked in gray in Table 2.

For psychosocial data, correlation analysis (not shown) revealed associations between coping strategies, internal locus of control, and life satisfaction, indicating that psychosocial adaptation plays an important role in QoL regulation. In a second step, a multiple regression analysis with QoL as a criterion was performed both from the disease-specific Haemo-QoL and the generic KINDL, which took into account specific clinical and psychosocial data (Table 3). QoL was clearly associated with life satisfaction and social support, but also with locus of control and (not significantly) with coping. The number of bleeds had an impact on QoL (more impairments in QoL with more bleeds). As for the treatment scheme (prophylactic vs. on-demand treatment), such differences failed to reach significance in the patient sample, but results suggested attention to QoL with on-demand treatment.

In open questions related to patients' and parents' perception of hemophilia care, high satisfaction was generally reported, but there were country-to-country differences, especially in terms of treatment patterns and patient information. In open-ended questions, patients and parents voiced concerns with regard to hemophilia as well as its care, including availability of factor, hopes with regard to new (genetically based) treatments, and problems in everyday life (e.g., issues of overprotection, dependency on medical system, loss of time for treatment, future perspectives).

TABLE 1. KINDL-Scores in Comparison to Other Chronic Diseases

KINDL Scales (range 0–100)	No. of Items	Haemophilia (n = 190) Mean (SD)	α	Asthma/Atopic Dermatitis (n = 360) Mean (SD)	α	Obesity (n = 606) Mean (SD)	α
Body	4	78.11 (14.2)	0.38	73.21 (15.46)	0.61	72.25 (16.84)	0.64
Emotion	4	83.39 (12.3)	0.43	82.41 (14.35)	0.65	79.38 (17.21)	0.71
Self-esteem	4	66.96 (21.5)	0.72	66.01 (19.18)	0.74	66.03 (19.8)	0.75
Family	4	81.34 (16.5)	0.60	75.36 (18.7)	0.72	72.98 (21.16)	0.77
Friends	4	82.76 (16.5)	0.60	79.76 (16.09)	0.66	75.85 (19.67)	0.75
School	4	65.75 (19.0)	0.36	70.9 (14.27)	0.51	67.22 (14.36)	0.53
Total-score	24	76.48 (10.2)	0.72	74.49 (10.67)	0.82	72.73 (11.74)	0.83
Chronic disease	6	84.61 (12.9)	0.36	76.07 (12.76)	0.68	74.11 (14.0)	0.63

Means (standard deviation) and Cronbach's α for the subscales of the KINDL.

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TABLE 2. Children's and Parents' Disease-Specific Quality of Life Rating (Haemo-QoL)

	I			II			III		
	Child	**Parent**	***p***	**Child**	**Parent**	***p***	**Child**	**Parent**	***p***
Physical health	18.26	17.35	n.s.	15.92	22.88	.019	19.85	20.28	n.s.
Feeling	17.58	15.57	n.s.	8.71	19.35	.000	11.10	18.49	.003
View	19.89	55.68	.000	15.63	21.90	.005	20.67	23.89	n.s.
Family	34.38	35.64	n.s.	20.78	24.81	n.s.	17.92	27.26	.000
Friends	18.48	17.93	n.s.	43.34	44.69	n.s.	46.13	45.72	n.s.
Perceived support	—	—	—	49.88	48.68	n.s.	54.55	51.97	n.s.
Others	22.22	13.47	.004	10.36	17.74	.000	12.76	18.07	.010
School	19.48	18.91	n.s.	23.38	28.52	.044	28.26	33.08	n.s.
Dealing	—	—	—	33.76	33.57	n.s.	31.94	29.19	n.s.
Treatment	25.00	26.40	n.s.	18.25	19.36	n.s.	23.20	21.61	n.s.
Future	—	—	—	—	—	—	29.14	33.64	n.s.
Partner	—	—	—	—	—	—	9.41	12.23	n.s.
Total	21.46	24.80	.053	20.59	24.49	.009	24.03	28.18	0.24

Transformed means for children and parents and *p*-values of the difference testing (n.s. = not significant).

DISCUSSION

This study showed that QoL in children and adolescents with bleeding as well as their families is an important issue and can be measured with adequate questionnaires. In comparison to other chronic conditions, QoL (KINDL) seems, in young hemophilia patients, relatively high. In the disease-specific measure (Haemo-QoL), the analysis showed that differences in QoL exist with regard to clinical and psychosocial data, especially for the older children. Such differences are relevant because they highlight areas of improvement in the care of patient and families. The fact that patients and parents did differ significantly only in a few of the QoL domains showed that families have similar views of the conditions and its care, although parents tend to overrate impairment. The results are encouraging and suggest that state-of-the-art hemophilia care is associated with a high QoL, although there is room for improvement. Improvement can be attained by providing an environment in which patients and parents feel understood and well informed and in which their psychosocial adaptation to the condition is considered important. Similar conclusions have been voiced in other studies.[12] The answers to open-ended questions also revealed the concerns of patients and parents. In particular, they confirmed that although hemophilia is a part of life in many families, there is uncertainty as to how to

TABLE 3. Multiple Regression Analysis for Quality of Life (Total Score of the Haemo-QoL and KINDL)

	Haemo-QoL				KINDL			
	II Children		III Adolescents		II Children		III Adolescents	
	β	**p**	**β**	**p**	**β**	**p**	**β**	**p**
Coping	—	—	0.185	0.094	—	—	—	—
Locus of control	—	—	—	—	0.299	0.004	—	—
Life satisfaction	−0.386	0.002	−0.320	0.015	—	—	0.561	0.000
Social support	—	—	0.424	0.003	−0.473	0.000	−0.266	0.023
On-demand	—	—	—	—	—	—	−0.201	0.041
Number of major bleeds	—	—	−0.225	0.046	—	—	—	—
R^2	16.2%		39.5%		37.1%		50.3%	

Percentage of explained variance of quality of life (R^2) by the determinants as well as beta and significance values (p-values).

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plan the future both for parents and patients. Hopes with regard to new treatment options are high and should be addressed in patient communication. The treatment-related focus on health economic issues thus should also take into account the patient perspective.[13]

In conclusion, the study showed that addressing both patients and parents gives families the possibility of expressing their views on hemophilia and represents an important issue in managing hemophilia.

APPENDIX

The Haemo-QoL group consisted of Pilar Arranz, Hospital La Paz, Madrid, Spain; Günther Auerswald, Zentralkrankenhaus, Bremen, Germany; José Aznar, Hospital Universitario La Fe, Valencia, Spain; Marijke van den Berg, Academisch Ziekenhuid Utrecht, Netherlands; Annie Borel-Derlon, Centre de l'Hémophilie, Caen, France; Hervé Chambost, Centre de l'Hémophilie, Marseille, France; Edith Fressinaud, Centre de l'Hémophilie, Nantes, France; R. Perez Garrido, University Hospital Virgen del Rocio, Sevilla, Spain; Alessandro Gringeri, Hemophilia & Thrombsis Center, University of Milan, Italy; Claude Guerois, Centre de l'Hémophilie, Chambray Lés Tours, France; Kate Khair, Great Ormond Street Hospital for Children NHS Trust, London, UK; Karin Kurnik, v. Haunerische Kinderklinik, München, Germany; Harald Lenk, Klinik für Kindermedizin, Universität Leipzig, Germany; Giovanni Longo, Centro Emofilia, Firenze, Italy; Felix Lucia, Servicio de Hematologia, Zaragoza, Spain; Laura Perugini, Ospedale Infantile "Regina Margherita," Torino, Italy; Marijolein Peters, Academisch Medisch Centrum, Amsterdam, Netherlands; Eduardo Remor, Hospital La Paz, Madrid, Spain; Chantal Rothschild, Centre de l'Hémophilie, Hopital Necker, Paris, France; Marc Trossaert, Centre de l'Hémophilie, Nantes, France; Monique Vicariot, Centre de traitement de l'hémophilie, CHU de Brest, France; Cornelia Wermes, Pädiatrische Hämatologie und Onkologie, Medizinische Hochschule, Hannover, Germany.

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