Quality of Life in Children and Adolescents with Gastroesophageal Reflux Disease

Gastroözofagiel Reflü Hastalığı Olan Çocuk ve Adolesanlarda Yaşam Kalitesi

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ABSTRACT

Objective: Children with gastroesophageal reflux disease (GERD) have significant co-morbidity. This study aimed to evaluate the health-related quality of life (HRQoL) in these children and adolescents by self and parent questionnaires. In addition, we also investigated the impact of gastroesophageal reflux symptoms on HRQoL.

Material and Methods: The study included 93 patients with GERD and 59 age and sex-matched healthy controls. We asked the children and their parents to complete the validated Turkish version of KINDer Lebensqualitätsfragebogen-Children Quality of Life Questionnaire (self-report and parent report, respectively) for assessing HRQoL. The patients have additionally completed a gastroesophageal reflux symptom questionnaire.

Results: The patients and their parents scored significantly lower on the general health perception (p=0.004) than the healthy controls. Especially physical well-being and emotional well-being subscales were negatively affected (p=0.000, and p=0.002, respectively). The most common symptoms in the patients were epigastric pain (70.9%), abdominal distention (64.5%), halitosis (58%), and regurgitation (50.6%). Epigastric pain significantly negatively affected the total HRQoL score in the patients (p= 0.003). The patients with GERD scored significantly higher than their parents in physical well-being (p=0.000) and family (p=0.000) subscale scores.

The patients with GERD evaluated their quality of life more negatively in self-esteem (p=0.000) and school domains (p=0.001) than did their parents.

Conclusion: GERD has a significant negative impact on HRQoL in children. The most affected domains are physical well-being and emotional well-being. Epigastric pain is associated with worse HRQoL scores.

Key Words: Child, Gastroesophageal reflux, Quality of life

ÖZ

Amaç: Gastroözofageal reflü hastalığı (GÖRH) olan çocukluklarda önemli komorbidite vardır. Bu çalışmada, hasta çocuk ve ergenlerin sağlıkla ilgili yaşam kalitesini (SYK) hastanın kendisi ve ebeveynlerin doldurduğu anketlerle değerlendirmeyi amaçladık. Ek olarak, gastroözofageal reflü semptomlarının SYK üzerindeki etkisi de araştırıldı.

Gereç ve Yöntemler: Çalışmaya 93 hasta ve 59 yaş ve cinsiyet uyumlu sağlıklı kontrol dahil edildi. Yüzyüze görüşmeyle çocuklardan ve ebeveynlerinden çocuğun SYK'ni değerlendirmek için Türkçe geçerli ve güvenilir versiyonu olan KINDer Lebensqualitätsfragebogen-Çocuk Yaşam Kalitesi Anketi'ni doldurmaları istendi. Hastalar ayrıca bir gastroözofageal reflü semptom anketi de doldurdular.

Bulgular: Hastaların ve ebeveynlerinin SYK puanı sağlıklı kontrollere göre anlamlı olarak daha düşük bulundu (p=0.004). Özellikle bedensel iyilik ve duygusal iyilik alt ölçekleri olumsuz etkilenmişti (sırasıyla p=0.000 ve p=0.002). Hastalarda en sık görülen semptomlar epigastrik ağrı (%70.9), karında şişkinlik (%64.5), ağız kokusu (%58) ve regurjitasyon (%50.6)'di. Epigastrik ağrı hastalarda toplam SYK'ni anlamlı olarak olumsuz etkiledi (p= 0.003).

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Hastalarla ebeveynlerinin doldurduğu anketler karşılaştırıldığında hasta çocukların bedensel iyilik (p=0.000) ve aile (p=0.000) alt ölçek puanları ebeveynlerine göre anlamlı derecede yüksekti. GÖRH olan hastalar, öz saygı (p=0.000) ve okul alanlarındaki yaşam kalitesini (p=0.001) ebeveynlerine göre daha olumsuz olarak değerlendirdi.

Sonuç: GÖRH, çocuklarda SYK üzerinde önemli bir olumsuz etkiye sahiptir. En çok etkilenen alanlar bedensel iyilik ve duygusal iyilik halidir. Epigastrik ağrı, daha kötü SYK skorları ile ilişkilidir.

Anahtar Sözcükler: Çocuk, Gastroözofagiel reflü hastalığı, Yaşam kalitesi

INTRODUCTION

Gastroesophageal reflux (GER) is caused by the transmission of gastric contents to the esophagus. GER becomes gastroesophageal reflux disease (GERD) when reflux leads to troublesome symptoms that affect daily functioning and lead to complications. Symptoms of GERD include heartburn, non-cardiac chest pain, acid regurgitation, chronic cough, bloating, and belching, which may seriously affect the quality of life of the patients (1,2).

The prevalence of GERD is 19.1% to 22.8% in Turkey (3-5). The majority of GERD increases with age and, by adolescence, is similar to that in adults (20%) (6). GERD is the most common chronic esophageal disorder in children and is linked with severe complications, such as bleeding, peptic stricture, Barrett's esophagus, pharyngitis, sinusitis, recurrent otitis media in children (2,7).

There is no gold standard diagnostic tool for diagnosing GERD in children (2). The definition of pediatric GERD is based on the 2009 guidelines of NASPGHAN and ESPGHAN (1).

In the majority of children, symptoms are mild or moderate. GERD symptoms may not be life-threatening, but patients usually seek treatment when their quality of life deteriorates. Studies in adults have shown that GERD may affect health-related quality of life (HRQoL), and the severity of the reflux symptoms has a more significant impact on regular daily activity (8). The HRQoL of adults with GERD is worse than the other chronic diseases such as diabetes or hypertension (9).

Eloubeidi et al. (10) compared the HRQoL scores in adult patients with Barrett's esophagus or GERD, and they have found that HRQoL was lower in both groups than the general population. Additionally, they have found no difference in HRQoL between patients with Barrett's esophagus or GERD. They concluded that symptom frequency and severity were associated with bodily pain and impaired social, emotional, and physical functioning in GERD (10). Additionally, GERD symptoms can lead to anxiety and depression (11).

However, the data in children and adolescents is scarce. Only a few studies evaluated the HRQoL in children with GERD (12,13).

The aims of this study were; 1) to compare the HRQoL of the patients with GERD and healthy controls, 2) to compare child and parent ratings of child HRQoL, 3) to examine the impact of GERD symptoms on HRQoL in the patients.

MATERIAL and METHODS

We performed this prospective cross-sectional study in our pediatric gastroenterology department between January 2018-September 2018. The study was approved by the Clinical Research Ethics Committee of Health Sciences University Ankara Pediatrics Hematology Oncology Training and Research Hospital (Acceptance number: 2018-106).

GERD in pediatric patients is present when reflux of gastric contents is the cause of troublesome symptoms or complications (1,14).

The children and adolescents aged between 8-18 were enrolled in the study. At the first admission to our pediatric gastroenterology clinic, the patients with GERD were asked to participate in this study. After we took informed consent, we have collected the data of the patients with GERD who had troublesome heartburn or acid regurgitation at least once a week over the past two months.

Patients with other chronic diseases and those receiving antireflux medicines during the study period were excluded. Additionally, patients were excluded when they could not self-report their HRQoL or communicate adequately. However, we recorded the symptoms of GERD, other accompanying complaints, and physical findings.

We gave information to the patients, healthy children, and their parents about the study. Then, after obtaining written informed consent from all children and their parents, we invited them to complete a standard validated questionnaire form (Kid-KINDL).

HRQoL was measured with the validated Turkish version of the KINDer Lebensqualitätsfragebogen KINDL® questionnaire (Kid-KINDL, 8–16 years) for children (self-report) and a proxy version for parents (proxy report) (15). Although KINDL was validated for use up to the age of 16, according to the final results on reliability and validity of the Revised Children's Quality of Life Survey for Children and Adolescents (KINDL-R), this test can be used for adolescents at 17 and 18 years of age, as shown in the studies (16,17).

The KINDL HRQoL form consisted of 24 items with five answer dimensions (never -seldom – sometimes – often - all the time)

distributed under six subscales: physical well-being, emotional well-being, self-esteem, family, friends, and functional aspects (18).

In addition, it consists of a disease perception subscale for chronic conditions or hospitalization. Some of the items were reversed as described in the manual in the calculation. Mean scores were calculated for each of the six subscales and the total scale and linearly transformed to a 0–100 scale. Higher scores indicate better HRQoL, as described in the manual. Details of the questions and calculations can be found on the KINDL website (www.kindl.org) (18).

Statistical analyses

Continuous variables were reported as mean±standard deviation (SD). The Shapiro-Wilk test was used to assess the normal distribution of the data. We analyzed the HRQoL scores using the Mann-Whitney U test after checking the data for normal distribution. Finally, we compared the HRQoL scores between the GERD and control group (self-report and parent-report). Multiple regression analyses were performed to determine the association between the HRQoL and demographic features and symptoms. All tests were two-sided, and a significance level of 0.05 was selected. We performed all statistical calculations in SPSS 20.0 (SPSS Inc, Chicago, IL, USA).

RESULTS

The questionnaires were administered to 95 patients with GERD and 63 healthy controls. Two patients with GERD and four healthy controls were excluded because they did not complete all questionnaires' subscales. In total, we enrolled 93 patients with GERD and 59 age and sex-matched healthy controls in the study. There was a female predominance in the patients with GERD (69.9%), and the mean age of the patients was 13.49±2.78. There was no age or sex difference between the patients and healthy children (p>0.05). Seventeen children were between 8-12 years, 76 were between 12-18 years in the GERD group, ten were between 8-12 years, 49 were between 12-18 years in the healthy control group. The parents' education was 50.3% primary school graduate, 54.9% secondary high school graduate, 14.1% university graduate. In 20.2% of families, the revenue was below the expenses, in 32.1% the income was equal to the fees, and in 47.6%, the payment was more than the expenses (Table I). There was no association of age, sex, parent education, and family revenue on the HRQoL in the patients (p>0.005).

Thirty of the patients had used proton pump inhibitors before. The most common symptoms in the patients were epigastric pain (66/93, 70.9%), abdominal distention (60/93, 64.5%), halitosis (54/93, 58%), and regurgitation (47/93, 50.6%). One-third of the patients had epigastric pain every day (32.3%). The duration of the symptoms was 3±11 months (median seven months).

Epigastric pain significantly negatively affected the total HRQoL score in the patients (p= 0.003). The frequency and multiple regression analyses of the symptoms in GERD patients are shown in Table II. We have found epigastric tenderness in 43 (46.1%) patients in physical examination.

Analyses of scores in the child-self questionnaires showed that the HRQoL scores of the patients with GERD were significantly lower than the healthy children (p=0.004). In addition, the patients with GERD had lower scores in physical well-being (p=0.000) and emotional well-being (p=0.002). Analyses of scores in the parent questionnaires showed that HRQoL was lower in children with GERD than the healthy controls (p=0.004). In addition, the patients with GERD had significantly lower scores in physical well-being (p=0.000) and emotional well-being (p=0.000) according to parent questionnaires analyses (Table III).

When we analyzed the child-self and parent reports in the GERD, the child-self scores in physical well-being (p=0.000) and family (p=0.000) subscale scores were significantly higher than their parents' scores. In addition, the patients with GERD evaluated their quality of life more negatively in self-esteem (p=0.000) and everyday functioning (school) domains (p=0.001) than did their parents (Table IV).

Table I: The characteristics of the children and adolescents and parents.

	GERD	Healthy Control	p
Age (mean±SD)	13.49±2.78	13.21±2.49	0.429
Sex, Female, n(%)	65 (69.9)	33 (55.9)	0.810
Parent education, n(%)			
Primary school	27 (57.4)	9 (37.5)	0.131
Secondary-high school	14 (29.8)	10 (41.7)	
University	5 (10.6)	5 (20.8)	
Monthly income status, n(%)			
Revenue is less than expenses	10 (17.5)	7 (25.9)	0.963
Revenue is equal to expenses	21 (36.8)	6 (22.2)	
Revenue is more than expenses	26 (45.6)	14 (51.9)	

Table II: Symptom frequency and physical findings of the patients.

	None/<1 week	2-3 times/week	4-5 times/week	everyday	B	p
Nausea/vomiting*	51 (54.8)	25 (26.9)	5 (5.4)	12 (12.9)	-0.367	0.569
Epigastric pain*	27 (29)	22 (23.7)	14 (15.1)	30 (32.3)	-3.059	0.003
Abdominal distention *	33 (35.5)	19 (20.4)	14 (15.1)	27 (29)	-0.288	0.752
Heartburn/chest pain*	56 (60.2)	29 (31.2)	3 (3.2)	5 (5.4)	1.291	0.216
Regurgitation*	46 (49.5)	22 (23.7)	14 (15.1)	11 (11.8)	-0.361	0.712
Halitosis*	39 (42)	13 (14)	10 (10.8)	31 (33.2)	0.025	0.972
Dysphagia*	77 (82.8)	9 (9.7)	3 (3.2)	4 (4.3)	-1.233	0.151
Sore throat*	64 (71.1)	16 (17.6)	4 (4.4)	7 (7.7)	0.104	0.923
Nocturnal cough*	74 (79.6)	9 (9.7)	2 (2.2)	8 (8.6)	0.990	0.354
Hoarseness*	84 (90.3)	4 (4.3)	2 (2.2)	3 (3.2)	-1.656	0.114
Constipation*	71 (76.3)	13 (14)	2 (2.2)	7 (7.5)	-1.124	0.230
Diarrhea*	77 (82.8)	15 (16.1)	1 (1.1)	-	-0.270	0.976

***n (%) , **B:** *Unstandardized coefficient of regression model*

Table III: The demographic features and Health-Related Quality of Life measures of the patients and healthy controls.

	No. of items	GERD n (mean±SD)	Healthy control n (mean±SD)	p
Age		93 (13.49±2.78)	59 (13.21±2.49)	0.429
HRQoL (Self-report)				
General		64.88±10.60	70.04±11.80	0.004
Physical well-being	4	93 (56.98±18.31)	59 (70.44±18.27)	0.000
Emotional well-being	4	93 (70.29±14.61)	59 (77.01±13.10)	0.002
Self-esteem	4	93 (52.48±24.52)	59 (56.25±23.47)	0.329
Friends	4	93 (70±19.35)	58 (74.20±19.46)	0.217
Family	4	93 (80.24±15.06)	59 (81.63±12.99)	0.606
Everyday functioning (School)	4	91 (58.79±15.53)	47 (58.37±17.73)	0.962
Disease module	6	26 (59.93±20)		
HRQoL (Parent)				
General		64.38±12.36	70.67±12.47	0.004
Physical well-being	4	92 (48.12±21.31)	57 (67.43±24.05)	0.000
Emotional well-being	4	92 (66.91±16.66)	57 (77.26±14.47)	0.000
Self-esteem	4	92 (68.88±21.92)	56 (65.51±19.43)	0.302
Friends	4	90 (66.13±18.13)	55 (71.96±14.35)	0.073
Family	4	92 (72.59±18.90)	57 (78.07±16.95)	0.056
Everyday functioning (School)	4	86 (64.46±19.39)	53 (64.07±19.09)	0.719
Disease module	6	26 (60.89±16.24)		

Table IV: Comparison of child-self and parent reports in patients with GERD.

	No. of items	GERD n (mean±SD)	Parent n (mean±SD)	p
HRQoL (Self-report)				
General		64.88±10.60	64.38±12.36	0.758
Physical well-being	4	93 (56.98±18.31)	92 (48.12±21.31)	0.000
Emotional well-being	4	93 (70.29±14.61)	92 (66.91±16.66)	0.054
Self-esteem	4	93 (52.48±24.52)	92 (68.88±21.92)	0.000
Friends	4	93 (70±19.35)	90 (66.13±18.13)	0.133
Family	4	93 (80.24±15.06)	92 (72.59±18.90)	0.000
Everyday functioning (School)	4	91 (58.79±15.53)	86 (64.46±19.39)	0.017
Disease module	6	26 (59.93±20)	26 (60.89±16.24)	0.827

Table V: Comparison of child-self and parent reports in healthy controls.

	No. of items	Healthy Controls n mean±SD	Parent n mean±SD	p
HRQoL (Self-report)				
General		70.04±11.80	70.67±12.47	0.475
Physical well-being	4	59 (70.44±18.27)	57 (67.43±24.05)	0.145
Emotional well-being	4	59 (77.01±13.10)	57 (77.26±14.47)	0.868
Self-esteem	4	59 (56.25±23.47)	56 (65.51±19.43)	0.000
Friends	4	58 (74.20±19.46)	55 (71.96±14.35)	0.293
Family	4	59 (81.63±12.99)	57 (78.07±16.95)	0.258
Everyday functioning (School)	4	47 (58.37±17.73)	53 (64.07±19.09)	0.045

In healthy children and adolescents, the self-esteem and everyday functioning scores were significantly lower than their parents' scores (p=0.000, and p=0.045, respectively). Table V compares the health-related scores of healthy children and their parents.

DISCUSSION

We have investigated the effect of GERD on the HRQoL of the children and adolescents in this study. GERD is a chronic disease characterized by troublesome symptoms and complications that may significantly impair a child's quality of life (QoL). The HRQoL in children is related to physical symptoms and morbidities and the impact of the disease on physical, emotional, mental, social functioning, all of which affect the ability to enjoy life, average healthy growth, and development of a child.

Marlais et al. (13) compared the HRQoL of the children with GERD to both children with IBD and healthy controls. They have found the HRQoL was significantly lower in the children with GERD than in the other two groups. Another study by Varni et al. (12) showed that the children with GERD had reduced HRQoL in physical, psychosocial, social, and school dimensions. There is only one study from our country, investigated the HRQoL in children with GERD. Similar to our findings, they have found lower scores in HRQoL in the patients and their parents than the healthy controls (19). Similar to these studies, we have demonstrated that the HRQoL is impaired in patients with GERD.

Previous studies have indicated that GERD symptoms may impact QoL independently of reflux burden. Quitadamo et al. (20)demonstrated a lack of correlation between the symptom severity reported by children and the esophageal histological grade. Varni et al.(12) showed that increasing GERD symptom severity, frequency, or duration were associated with worse QoL scores in children than physiologic abnormalities.

A more recent study of 82 children found that abnormal pH-impedance testing did not have reduced quality of life scores on validated questionnaires but gross esophagitis was associated with quality of life impairments (21).

The present study has shown that epigastric pain was the most common symptom. Additionally, nearly one-third of the patients described epigastric pain every day. Chronic pain can be the most debilitating condition in daily life and impact the child's ability to enjoy life. Epigastric pain was associated with lower HRQoL scores, consistent with previous reports showing that symptom severity is negatively associated with QoL (12,21).

Primarily physical and emotional well-being subscales were significantly negatively affected in our patients with GERD. Similar to child self-reports, we have found lower scores in the same domains in the parent reports. Although GERD is a benign disease, it is also an essential source of stress and impacts a child's daily routine activities. The patients with GERD have emotional and behavioral problems (22). Foong et al. (23) found that children with non-Immunoglobulin-E mediated gastrointestinal allergies had worse physical and emotional functioning scores similar to our study.

GERD negatively affects not only the HRQoL of the child but also the family in their activities of daily living (24). In pediatrics, both child and parental perceptions are taken into consideration. It is known that children with functional or organic gastrointestinal disease missed more school, spent more days in bed, and had greater healthcare utilization (12). From the parents' perspective, living with a child with chronic illness is associated with significant stress, worry about whether the child may recover or not, multiple admissions to the hospital, the necessity of medicine in disease and drug side effects, and absenteeism from work.

It is essential to identify the presence of variation in the perception of HRQoL in children and their parents as what a subscale feeling for a parent may not be the same as the child's feeling. Children may differ from adults in their understanding of health, and their beliefs about the disease will improve or not. Our study indicated a variation in feelings of the patients with GERD and their parents in four domains (physical well-being, self-esteem, family, and everyday functioning-school). In agreement with other studies with healthy children, we have found that the parents underestimated their child's HRQoL in physical well-being and family domains (25,26). However, self-esteem and school domains were overestimated.

Parents' ratings of the childs' HRQoL may be influenced by their own emotions and personality (26). In pediatrics, clinicians should consider parents' anxiety and worries in assessing the parent report of the child's QoL. Jozefiak et al. (28) reported that almost 90% of the patients' mothers said they were stressed due to their child's disorder, while only about 50% of the patients did.

Like previous studies, our parents overestimated their child's physical symptoms, as do parents of children with asthma and diabetes mellitus (29,30).

According to the parents, these data imply that the GERD patients experience limitations because of physical symptoms, and these symptoms negatively affect the child's family relationships. Nowadays, more mothers have to work outside their homes all day, which made them think that they did not spend enough time for their sick children, resulting in guilt and underestimating the family subscale.

According to the patients' and healthy controls' questionnaires in our study, self-esteem and everyday functioning (school) subscales were negatively affected in children than their parents' reports. All of the patients in our study were older than eight years old and were of school age. This difference could be related to increased academic stress in school and issues related to age.

Our study had some limitations. First, it is conducted in a limited homogenous sample of children and adolescents with GERD in the center of Turkey. Accordingly, these results do not have external validity to generalize to all patients with GERD. We did not record the previous medications, duration of the earlier treatments. And lastly, we did not record the endoscopic and histopathological findings. However, our study had some strengths. The strengths of our study include large pediatric size, use of validated HRQoL scales, including both patients and healthy children and their parents. Psychometric properties of QoL measures also have to be considered concerning the child's age. We selected patients older than eight years old because the children's cognitive abilities and well-being are higher after this age. In addition, these children and adolescents have a better ability to recognize and describe symptoms.

As a result, this study demonstrated that GERD negatively affects the HRQoL in children and the most affected domains were physical well-being and emotional well-being. The impairment of the HRQoL may be explained by the presence of GERD and bodily pain. Epigastric pain may directly impact HRQoL scores in patients with GERD.

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