Effects of Chronic Gastritis on Sleep and Quality of Life in Adolescents

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ABSTRACT

Aim: This study aims to evaluate the sleep quality and the quality of life of adolescents with chronic gastritis, and determine the related factors.

Materials and Methods: This study included patients who were diagnosed with chronic gastritis both clinically and histopathologically. The Pittsburgh Sleep Quality Index and Epworth Sleepiness Scale were used to assess the sleep quality, and the Pediatric Quality of Life Inventory was used to assess the quality of life. The control group included healthy volunteers with no chronic diseases and no gastrointestinal system complaints.

Results: Fifty-six patients with gastritis and 55 healthy volunteers were included. The patients with gastritis were found to have significantly lower overall quality of life subscale, and total scale scores, except the social functioning total score. Except for the subjective sleep quality, significant differences were seen between the groups in the sleep quality subscale, total scale, and sleepiness scale averages. The total score of sleep quality scale was significantly higher in patients who had lower incomes than expenses. There were no significant differences in between the obese or overweight patients with gastritis and rest of the gastritis patients in the study sample. There were no significant differences found between the Helicobacter pylori positive and negative gastritis patients in terms of the total quality of life and sleepiness scale scores.

Conclusion: This study is important because it is the first study in adolescents in this respect. The sleep and quality of life scores of the adolescents with chronic gastritis were lower than the control group.

Keywords: Gastritis, quality of life, sleep, adolescent

Introduction

Gastritis is defined as the inflammation of gastric mucosa with microscopic evidence (1). Gastritis and peptic ulcer disease are the results of an imbalance between the mucosal defensive and aggressive factors. Gastritis and peptic ulcer disease can be divided into two major categories: as primary and secondary (such as hypersecretory conditions, stress, granulomatous and immunologic/allergy situations) on the basis of the underlying etiology (2). Most cases of primary or unexplained gastritis are now known to be caused by Helicobacter pylori (H. pylori) (3). Data on acid secretion in children are limited and old and their interpretations complicated by the considerable overlap in acid secretion between children with and without ulcers (4). There are no accurate figures related to the precise incidence of gastritis in children. As for ulcer disease, H. pylori is probably no longer the major cause of gastritis in many parts of the world (5). In a prospective study of 100 children who underwent upper gastrointestinal system (GIS) endoscopy due to dyspeptic symptoms, 79% found have gastritis (none had ulcer disease), of whom only 33% had H. pylori infection (6).

The Sydney classification of gastritis aims to combine topographic, morphologic, and etiologic enformations to form a clinically relevant scheme (7). This classification and grading, which now incorporates the use of a visual analogue scale, is accepted as the standard research method by which all gastric biopsies from adult patients commonly assessed (8). The updated Sydney system is currently the most widely accepted classification for gastritis, even in children (8).
In gastritis cases, the etiological factors and the patient’s response to the enflammation may change the clinical findings. The inflammation of the gastric mucosa is among the most frequent causes of abdominal pain in children (9). Gastritis can affect an individual’s daily activities, and this creates an important health problem for both the social and economic points of view. Gastritis may lead to an observable worsening in the quality of life and affect the quality of sleep for adult patients (10,11). There are no studies in the contemporary international literature that is focused on the qualities of sleep and life in children and adolescents with gastritis. Therefore, this study aimed to conduct an evaluation of the sleep and life qualities of children and adolescents with gastritis and identify the relevant factors.

**Materials and Methods**

**Study Population**

This study included patients between the ages of 13 to 18 years old who applied to Izmir Tepecik Training and Research Hospital pediatric gastroenterology clinic between August 2017 and October 2017 and received clinical and histopathological chronic gastritis diagnoses. Those patients underwent upper GIS endoscopies; gastric biopsy samples were taken from the antrum and corpus due to gastrointestinal symptoms (such as chronic abdominal pain, dyspepsia, vomiting, and abdominal distention) that had been ongoing at least a month (8). Patients diagnosed with a disease other than gastritis via clinical, endoscopic, and histopathological findings (such as eosinophilic esophagitis, reflux esophagitis, or inflammatory bowel disease) were not included in the study. In the literature, it has been shown that children may experience impaired quality of life and sleep in different chronic diseases (12-14). For this reason, gastritis patients with additional chronic diseases were excluded from this study. Upper gastrointestinal endoscopy biopsies were assessed according to Sydney classification by the pathologist. The adolescents who found to have chronic gastritis, with no additional chronic disease and additional histopathologic findings in the pathology reports and who agreed to participate in the study were included. The Pittsburgh Sleep Quality Index (PSQI) and Epworth Sleepiness Scale (ESS) were used to evaluate the sleep quality. The quality of life was evaluated via Pediatric Quality of Life Inventory (PedsQL) that was suitable for this age group. Only the children who could read, understand, and complete all of the used scales were included in this study.

The data obtained was assessed through comparisons with a healthy control group. Healthy controls were selected from healthy volunteers who presented to the pediatric gastroenterology and pediatric outpatient clinics. For the comparisons, the sleep and life quality scales were applied to a group of healthy volunteers of the same age and gender who did not have any chronic diseases or gastrointestinal system complaints. The patients’ demographic findings, complaints during application, endoscopic findings, and H. pylori positivity status were identified and evaluated together with the life and sleep qualities. In addition, the relationship between the income levels of the patients and sleep quality was assessed. For this purpose patients were divided into three groups as follows; patients whose income is lower than expenses, patients whose income is equal to the expenses, and the patients whose income is higher than the expenses, the patients were asked to state their income status accordingly. Each patient’s body mass index (BMI) percentile was determined according to their age and sex, and those with BMI ≥ 95 percentile were considered as obese, while those with BMI = 85–95 percentile were considered as overweight (15). In addition, the relationship between BMI and the life and sleep qualities were assessed. Healthy volunteers with normal BMI ratios that are ranging between 5-95 were included in the control group. Children who were not in the 5-95 percentile range were not included in the control group. Both the patient and control groups had no drug use or acid suppressive treatment history and did not have disease that could affect sleep quality, such as sleep apnea.

This study is approved by the ethics committee of Tepecik Training and Research Hospital (approval number:17.08.2017/18). We obtained informed consents from all the children who participated in this study, as well as their families.

**Study Scales**

**PedsQL**

The PedsQL was developed for children, and it is a widely used, easy, and generic quality of life measure that can be implemented in a short time period (16). There are two different scale forms, a self-reported scale and a parent scale. Each scale is modified according to the following age groups; 2–4, 5–7, 8–12, and 13–18 years-old and the modifications were designed by accounting the characteristics of each age group. The scale consists of four subgroups that are aiming to question the physical, emotional, social, and school related functions. The self-reported and parent forms each consist of 23 clauses. The score of the clauses is linearly converted to a value between 0 and 100, and a higher number of points indicate a higher quality of life. A Turkish validity and reliability study of the PedsQL has been conducted for adolescents (17).

**PSQI**

The PSQI is a self-reported scale consisting of 19 items that evaluate the sleep quality and sleep disorders over the last month. Each component is scored between 0–3 points, and the total of the 7 components (Subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, daytime dysfunction)
gives the total score of the scale. A total point score of over 5, indicates a “bad sleep quality” (18). The Turkish version of the PSQI was developed by Agargun et al. (19).

**ESS**

The ESS is an 8-item self-administered scale that is easy to use, and it evaluates the general sleepiness of an individual in 8 different daily life situations. The ESS score ranges between 0 to 24 and higher ESS scores indicate greater daytime sleepiness (20). The ESS has a high sensitivity and a high specificity with a cut-off score of >10 for an abnormal level of daytime sleepiness (21). The Turkish validity and reliability study of the ESS was conducted by Izcı et al. (22).

**Statistical Analysis**

The quantitative variables were expressed as the mean and standard deviation, while the categorical variables were expressed as numbers and percentages. The conformity assessment of the normal distribution of the numerical data for a single sample was performed using the Shapiro-Wilk test. Bivariate comparisons were conducted with chi-square test (with Yats’ and Fisher’s corrections when needed), and for the independent groups, Student’s t-test or Mann-Whitney U test was used depending on the normal the normal distribution. Bivariate correlations were conducted with Pearson’s or Spearman’s correlation analyses depending the normal distribution. All of the statistical tests were performed with the Statistical Package for the Social Sciences version 18.0 (SPSS, Inc., Chicago, IL, USA). A p-value of less than 0.05 was considered as statistically significant.

**Results**

This study focused on 56 patients with chronic gastritis and 55 healthy volunteers. The age and gender distributions of the patient and control groups were similar (Table I). Overall, at the time of the 60.7% of the patients with gastritis presented with complaints of dyspepsia, 30.4% had abdominal pain, 30.4% had vomiting, 17.9% had nausea, and 10.7% presented with complaints of abdominal distention. The endoscopic assessment revealed that 34 patients (60.7%) had pangastritis and 22 patients (39.3%) had antral gastritis. There was not any statistical difference between the complaints of children who had pangastritis and children who had antral gastritis according to the chi square analysis (p=0.758, z=6.548 respectively). Also, three patients had bulbus ulcers and one patient had an antral ulcer. Similarly, no statistically significant difference was found between the complaints of adolescents with and without ulcer (p=0.909 z=0.958 respectively). The upper GIS endoscopy biopsy samples of the patients were evaluated histopathologically, and it was determined that 48 (85.7%) of the patients had non-atrophic pangastritis, 6 (10.7%) had antral predominant nonatrophic gastritis, and 2 (3.6%) had atrophic pangastritis.

It was determined that the patients with gastritis had lower scores than the healthy controls, which was statistically significant in all the quality of life subscale scores and in the total scale score, with the exception of the social functioning total score (Table II). A comparison of the sleep quality of the gastritis patients with that of the healthy control group showed that there was a statistically significant difference between the two groups in all the subscale scores and the total scale score averages, except for the subjective sleep quality (Table III). There was no statistically significant relationship between the sleep quality and symptoms (r=-0.069, p=0.612). Moreover, the average sleepiness scale score of the gastritis patients was significantly higher than the average of the healthy controls (Table III). A comparison between the female and male patients suggested that there was not a statistically significant difference between the genders regarding the quality of life, sleep quality, and sleepiness total scale score (p=0.27, p=0.07, and p=0.6, respectively).

There was no significant difference between the patient and the control groups regarding the income and expenses (Table I). Also, no statistically significant difference was found between the groups according to their economic conditions concerning the average of the life quality subscale and total scale scores and the sleepiness scale score. In the patient group the sleep quality scale total score of those with lower incomes than expenses was meaningfully higher when compared to those whose incomes were either equal to or higher than their expenses (p=0.024); while there was not any significant difference between the sleep quality of the control group and economic conditions (p=0.958). According to the Spearman correlation analysis, there was not any correlation between the sleep quality and socioeconomic status (r=-0.096 p=0.482).

Eleven (19.6%) of the patients with gastritis were considered to be obese or overweight. The comparisons of these patients with the other gastritis patients showed that there was no statistically significant difference regarding the quality of life, sleep quality total scale score, and sleepiness scale average score (p=0.28, p=0.17, and p=0.63, respectively).

*H. pylori* was detected in 25 (44.6%) of the patients who was confirmed to have gastritis via histopathology. The comparison of *H. pylori* positive patients with the *H. pylori* negative patients showed that there was no statistically significant difference between the two groups concerning the quality of life and sleepiness scale total scores (p=0.89 and p=0.38, respectively). The assessment of the two groups concerning the sleep quality showed that there was a statistically significant difference in the sleep duration subscale score (p=0.029), but not in the other subscales and total scale scores (p=0.96).
Children with functional gastrointestinal disorders, such as functional abdominal pain, functional dyspepsia, and irritable bowel disease, have been reported to have significantly lower life quality than the healthy controls (12). Several studies point out deterioration in the quality of life together with the chronic gastrointestinal diseases such as gastroesophageal reflux, constipation, and inflammatory bowel disease during childhood (12,13,23). It has also been reported that the low qualities of life of children with constipation improved after they received constipation treatment (24). In a study conducted on dyspeptic pediatric patients who had esophagitis or normal histological
findings, after an average of 7.6 years of follow up, it was found that during the adolescence and young adulthood period the patients had lower quality of life scores, worse dyspeptic symptoms, and more functional insufficiency when compared to the control group (25). Nevertheless, there are no studies considering the life and sleep qualities together in adolescents who have gastritis in the literature.

The studies conducted on adults with gastrointestinal diseases, such as peptic ulcers and gastroesophageal reflux, have reported lower life quality scores than the normal population, but also found significantly increased life quality scores after the treatment (26,27). A study issuing adults showed that patients with chronic gastritis had lower average scores when compared to the patients with peptic ulcers in all the life quality subscales, except for the physical functioning scale score (10). When compared with the normal population, both groups of patients had lower qualities of life (10). In our study, we examined the effects of gastritis on the life and sleep qualities of adolescents, and observed that the adolescents with gastritis had lower life qualities in all the subscales, except for the social functioning scale score and the total score.

In a previous study from China that was focused on adult patients with gastritis and peptic ulcers, indicated that women with low-income levels had lower qualities of life. The differences in the distribution of the women and men in both the patient groups were reported to affect those results (10). In our study, the quality of life assessment of the patients with gastritis depending on the gender and income level did not reveal a statistically significant difference.

Sleeping is a fundamental and essential daily life activity that affects the life quality and health of human beings (28). The sleep quality can be affected by many factors, such as the lifestyle, environmental factors, work, social life, economic conditions, general health state, and stress (29,30). In our study, while sleep quality was poor in chronic gastritis patients whose expenses were higher than their incomes, in the control group the income level had no adverse effect on sleep quality. However, the limitation of this study is that our patients were not assessed for negative factors such as negative social environment and unhealthy living conditions (access to clean water and food, nonhygienic living space and nutrition characteristics). In our study, it is seen that the gastritis patients had worse sleep quality scores than the controls regarding all the subscale scores and the average of the total scale scores, except for the subjective sleep quality. Subjective sleep quality is a component that is based on someone's interpretation of what they think about their sleep quality. The fact that our patients are not significantly different from controls regarding subjective sleep quality may be related to their inability to interpret sleep qualities poorly or to be unaware of their sleep quality. Daytime sleepiness is an important clinical and public health problem that reduces the quality of life significantly. In our study, we determined that the gastritis patients have significantly higher daytime sleepiness scale scores than the healthy controls. We think that various symptoms related to gastritis, such as abdominal pain, dyspepsia, vomiting affect the daily functioning of the individual and the daytime sleep pattern. However, in our study, when the sleep quality and the symptoms were examined a statistically significant relationship was not found. In our study, the comparison between the male and female patients regarding the sleep quality and daytime sleepiness revealed that there was no statistically significant difference between the genders. Moreover, the detection of H. pylori in the gastritis patients did not have any effects on the quality of life, daytime sleepiness, or general sleep quality, but the sleep duration was shorter when compared to the H. pylori negative patients.

A study conducted by Filik et al. reported a significant relationship between gastritis or erosive esophagitis and short sleep duration in adults. This relationship was especially meaningfully higher in the overweight or obese patients (11). It has been reported that a high BMI can lead to sleep disorders in adults and that obese patients may suffer from sleep disorders and sleeping difficulties (31,32). Moreover, childhood obesity may lead to many complications that can damage the quality of life, such as poor academic performance, psychological findings, lifelong obesity, and cardiovascular disease (33). In one study of 144 obese and overweight children, the sleep quality scores assessed via the PSQI and were found to be worse than those of healthy children (34). In our study, 19.6% of the patients with gastritis were obese or overweight, and their sleep qualities and qualities of life were not worse when compared to the rest of the gastritis patients in the study sample.

**Conclusion**

This study is important because it was the first to evaluate the quality of life and sleep quality in adolescents with chronic gastritis. In our study, adolescents with chronic gastritis had poor sleep quality and lower quality of life scores. The limitations of this study are the small sample size and the unevaluated negative factors such as negative social environment and unhealthy living conditions. In addition, our patients were not able to assess the sleep and quality of life after gastritis treatment. For this reason, we think that future studies evaluating chronic gastritis adolescents will be useful.

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**Ethics**

**Ethics Committee Approval:** The study was approved by the SBU Tepecik Training and Research Hospital Ethics Committee (approval number:17.08.2017/18).

**Informed Consent:** Consent form was filled out by all participants.

**Peer-review:** External and internal peer-reviewed.

**Authorship Contributions**


**Conflict of Interest:** No conflict of interest was declared by the authors.

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