Characteristics of Sleep Disturbances in Patients with Gastroesophageal Reflux Disease

Narika Iwakura¹, Yasuhiro Fujiwara¹, Masatsugu Shiba¹, Masahiro Ochi², Takashi Fukuda³, Tetsuya Tanigawa¹, Hirokazu Yamagami¹, Kazunari Tominaga¹, Toshio Watanabe¹ and Tetsuo Arakawa¹

Abstract

Objective  Gastroesophageal reflux disease (GERD) is strongly associated with sleep disturbances; however, the detailed differences in the characteristics of sleep disturbances between GERD and non-GERD patients are unknown. The aim of the present study was to analyze the clinical characteristics as well as health-related quality of life in GERD and non-GERD patients with sleep disturbances.

Methods  Three hundred and fifty patients, including 124 patients with GERD and 226 patients without GERD, completed a self-administered questionnaire that evaluated clinical information. The Pittsburgh Sleep Quality Index (PSQI), Hospital Anxiety and Depression Scale (HADS), Insomnia Severity Index (ISI), Epworth Sleepiness Scale (ESS) and 8-item Short-Form Health Survey (SF-8) were also used. Sleep disturbance was considered to be present if the PSQI was >5.5.

Results  The prevalence of sleep disturbances was significantly higher in the GERD patients (66/124, 53.9%) than in the non-GERD patients (89/226, 39.3%). Depression and anxiety were significantly more common in the subjects with sleep disturbances than in those without sleep disturbances, although there were no differences between the GERD and non-GERD patients. Among the subjects with sleep disturbances, daytime sleepiness was more common in the GERD patients than in the non-GERD patients. The subjects with sleep disturbances had a poorer health-related quality of life. The physical components of quality of life were impaired, particularly in the GERD patients with sleep disturbances.

Conclusion  GERD patients with sleep disturbances commonly experience daytime sleepiness and an impaired health-related quality of life, especially in terms of physical components.

Key words: gastroesophageal reflux disease, sleep disturbances, daytime sleepiness, health-related quality of life

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Introduction

Gastroesophageal reflux disease (GERD) is caused by the reflux of gastric contents into the esophagus and is characterized by symptoms such as heartburn. A systematic review reported that the prevalence of GERD (defined as the onset of heartburn and/or acid regurgitation at least weekly) in Western countries is 10-20%, with a lower prevalence in Asia (1). However, the frequency of GERD in Asia, including Japan, has recently been reported to be increasing (2). Several studies have also reported that GERD is strongly associated with sleep disturbances (3-10). For example, Shaker et al. reported that 79% of 1,000 adults with GERD have nighttime heartburn. Among these individuals, 75% reported that GERD symptoms affected their sleep, 63% believed that these symptoms negatively affected their ability to sleep well, 40% believed that sleep difficulties caused by night-
time heartburn impaired their ability to function the following day and 42% stated that they accepted the fact that they could not sleep through the night (3). Such impairment of sleep in patients with GERD results in socioeconomic complications, through reduced work productivity and daily life activities (11, 12), leading to considerable economic loss and lower health-related quality of life (HR-QOL).

Sleep disturbances are common in the general population. In 2008, the National Sleep Foundation’s Sleep in America Poll demonstrated that approximately half of all participants reported non-refreshing sleep a few nights per week or more, with 42% reporting frequently waking at night and 26% reporting difficulty in falling asleep (13). Nationwide epidemiological studies in Japan have shown that the prevalence of sleep disturbances is approximately 17.3-22.3% for men and 20.5-21.5% for women (14-17). In addition, a nested case cohort study conducted in the UK indicated that there is a clear association between sleep disturbances and smoking, excessive alcohol consumption, psychiatric disorders (stress and depression), cardiovascular diseases (heart failure and coronary heart disease) and gastrointestinal diseases, including GERD and irritable bowel syndrome (18).

Nevertheless, the specific clinical features of sleep disturbances in GERD patients are unknown. Therefore, the aim of the present study was to compare the characteristics of sleep disturbances between GERD patients and non-GERD patients using several self-administered questionnaires.

Materials and Methods

Study subjects

This study was part of a cross-sectional study conducted between April 2012 and November 2013 at Osaka City University, Meijibashi and Minamiosaka hospitals to examine the associations between sleep disturbances and gastrointestinal diseases. The GERD patients included in this study were adult outpatients (age >20 years) who visited the participating hospitals during the survey period and experienced heartburn symptoms at least twice a week, irrespective of treatment with acid-suppressing drugs. The control patients were adult outpatients (age >20 years) who visited the participating hospitals during the survey period and experienced heartburn symptoms at least twice a week, irrespective of treatment with acid-suppressing drugs. The control patients were adult outpatients (age >20 years) who visited the participating hospitals during the survey period and experienced heartburn symptoms at least twice a week, irrespective of treatment with acid-suppressing drugs. The control patients were adult outpatients (age >20 years) who visited the participating hospitals during the survey period and experienced heartburn symptoms at least twice a week, irrespective of treatment with acid-suppressing drugs. The control patients were adult outpatients (age >20 years) who visited the participating hospitals during the survey period and experienced heartburn symptoms at least twice a week, irrespective of treatment with acid-suppressing drugs. The control patients were adult outpatients (age >20 years) who visited the participating hospitals during the survey period and experienced heartburn symptoms at least twice a week, irrespective of treatment with acid-suppressing drugs.
Results

Prevalence of sleep disturbances and clinical characteristics of the study subjects

Sleep disturbances were reported in 66 of 124 (53.3%) GERD patients and 89 of 226 (39.3%) non-GERD patients (Fig. 1), suggesting that the prevalence of sleep disturbances was significantly higher in the GERD patients (p<0.05). The clinical characteristics of the GERD and non-GERD patients according to the presence and absence of sleep disturbances are shown in Table 1. Although the GERD patients with sleep disturbances were predominantly female, there were no differences in age, BMI, smoking, alcohol drinking, bedside drinking, caffeine intake habits or the presence of snoring or apnea between the four groups.

The rates of ISI were significantly higher in both the GERD and non-GERD patients with sleep disturbances than in the non-GERD patients with sleep disturbances; however, no differences were found between the GERD and non-GERD patients without sleep disturbances. The prevalence of sleep disturbances among both the GERD and non-GERD patients with and without sleep disturbances was significantly higher in the GERD patients with sleep disturbances than in the non-GERD patients with sleep disturbances. Although there were no differences in the ESS scores among the four groups, the prevalence of a positive ESS score was significantly higher in the GERD patients with sleep disturbances (Table 2).

Prevalence of depression and anxiety in the controls and GERD patients according to the presence of sleep disturbances

Fig. 2 shows the prevalence of depression and anxiety in the four groups. The prevalence of depression and anxiety was higher in both the GERD and non-GERD patients with sleep disturbances than in those without sleep disturbances, although there were no differences between the GERD and non-GERD patients.

Differences in HR-QOL between the controls and GERD patients with and without sleep disturbances

The scores for all HR-QOL domains and summary scores, such as PCS and MCS, were significantly lower in the subjects with sleep disturbances than in those without sleep disturbances among both the GERD and non-GERD patients. Interestingly, the scores for BP and VT and the PCS scores were significantly lower in the GERD patients with sleep disturbances than in the non-GERD patients with sleep disturbances (Fig. 3).

Discussion

Approximately half of all the GERD patients in the present study experienced sleep disturbances, as assessed by the PSQI. Several reports have found that the prevalence of sleep disturbances in GERD patients ranges between 40% and 68% (3, 4, 7, 8, 10), which is similar to the findings of our study, although the precise definition of sleep disturbances differs in each study. It should be noted that our observed prevalence of sleep disturbances in the non-GERD patients was higher (39%) than that seen in the general Japanese adult population (approximately 20%), as we chose to assess outpatients as controls.

Numerous factors can affect sleep; in particular, psychological factors play crucial roles in the onset of sleep disturbances (14, 29, 30). The present results showed that the
prevalence of depression and anxiety was high in the subjects with sleep disturbances, although there were no differences between the GERD and non-GERD patients. These results suggest that depression and/or anxiety are associated
with sleep disturbances, but are not specific to GERD patients. This speculation is supported by two large epidemiological studies. Jansson et al. conducted a population-based study among 65,333 subjects in Norway, including 3,153 patients with reflux symptoms, and found that GERD was associated with insomnia (OR, 3.2), sleeplessness (OR, 3.2) and difficulty falling asleep (OR, 3.1), after adjusting for several confounding factors, including anxiety and depression (31). In addition, Mody et al. analyzed data from the 2006 US National Health and Wellness Survey, which included 11,685 patients with GERD and 29,634 patients without GERD, and reported that GERD was significantly associated with difficulty sleeping (OR, 2.09) after adjusting for eight factors, including age, race, sex, marital status, education, number of physical comorbidities, presence of psychiatric conditions and BMI (8).

In the current study, daytime sleepiness was significantly more common in the GERD patients with sleep disturbances than in the non-GERD patients with sleep disturbances. The exact reasons for the association between daytime sleepiness and GERD were unknown; however, this finding suggests that sleep disturbances in GERD patients might be due to obstructive sleep apnea. Although polysomnography was not used in this study, there were no differences in the incidence of reported symptoms, such as snoring and apnea, between the GERD and non-GERD patients or among the GERD patients with and without sleep disturbances, suggesting that obstructive sleep apnea may not play a major role in the pathophysiology of sleep disturbances in GERD patients. In addition, several studies have demonstrated that there is insufficient evidence of a causal relationship between obstructive sleep apnea and GERD, and the two disorders are likely associated based on similar risk factors, such as obesity (32).

Several studies have shown that the HR-QOL is impaired in GERD patients, especially those with sleep disturbances (4, 8, 33). Our findings are consistent with these results, and the current data also showed that the scores for the physical components of the HR-QOL were significantly lower in the GERD patients. Therefore, the development of sleep disturbances in GERD patients might be due to physical conditions, such as nighttime heartburn, acid regurgitation or chest pain. This hypothesis is supported by our previous study that showed that acid reflux directly causes sleep disturbances via sleep fragmentation and poor sleep quality (34).

Our study is associated with several limitations. First, we defined sleep disturbances based on the results of a self-administered questionnaire; therefore, objective sleep parameters obtained using polysomnography or actigraphs were not evaluated. Second, we included patients taking acid-suppressive drugs. Several clinical trials have demonstrated that proton pump inhibitors significantly reduce the incidence of subjective sleep disturbances in patients with GERD (35-37). Therefore, the prevalence of sleep disturbances in the GERD patients in the present study might be underestimated. However, we underline the finding that the prevalence of sleep disturbances in our study is similar to that seen in previous reports. This may be due to the nature of the enrolled study subjects; namely, patients with GERD

Figure 3. Health-related quality of life in GERD and non-GERD patients. *p<0.05 versus control with sleep disturbances. PF: physical functioning, RF: role physical, BP: bodily pain, GH: general health perception, VT: vitality, SF: social functioning, RE: role emotional, MH: mental health, PCS: physical component summary, MCS: mental component summary.
symptoms at least twice weekly who were likely also on acid-suppressive medications. Third, we did not evaluate the severity of GERD symptoms in this study. In the future, a detailed study is required to assess the association between sleep disturbances and the severity of GERD symptoms using the F-scale. Fourth, the non-GERD patients in this study included patients with functional dyspepsia. Since some studies have reported that functional dyspepsia is associated with sleep disturbances (38, 39), the prevalence of sleep disturbances in the non-GERD patients was likely underestimated in this study. Finally, we did not include all confounding factors in our analysis, although it is difficult to systematically analyze all factors associated with sleep disturbances.

In conclusion, approximately half of the GERD patients in this study experienced sleep disturbances. Daytime sleepiness was more common in GERD patients with sleep disturbances. Prevalence of anxiety and depression was high in patients with sleep disturbances, suggesting that psychological factors are not specific for the sleep disturbances observed in GERD. Moreover, GERD patients with sleep disturbances had poorer scores on the physical components of HR-QOL.

The authors state that they have no Conflict of Interest (COI).

References