

*Original Investigation*

Comparison of Sleep Quality and Sleepiness in Patients Operated for Pituitary Adenoma and in Healthy Individuals

Nail Caglar TEMIZ¹, Yunus KACAR¹, Royal MEHTIYEV¹, Mehmet Can EZGU¹, Omer KARAKOC²¹University of Health Sciences, Gulhane Education and Research Hospital, Department of Neurosurgery, Ankara, Turkey²University of Health Sciences, Gulhane Education and Research Hospital, Department of Otorhinolaryngology, Ankara, Turkey**ABSTRACT**

AIM: To investigate whether sleep quality and sleepiness of patients who undergo surgery for pituitary adenomas differ from healthy individuals.

MATERIAL and METHODS: Forty-four patients who were operated for pituitary adenomas and 44 healthy individuals, 88 subjects in total, were evaluated by a questionnaire. All questionnaires and scales were applied by the same researcher without the name of the participant in order to maintain consistency. Statistical analyses were conducted with the SPSS for Windows 23.00 package program.

RESULTS: Of the 88 participants, 44 (50%) were patients who were operated for pituitary adenomas, while 44 (50%) were control subjects. 38 (43.2%) of the participants were male, 50 (56.8%) were female. The average age of the participants was 37 ± 12.24 years. The best sleep quality was found in 41-50 years group (7 patients). In the control group, 23 patients (52.3%) had a sleep quality index above 5 and 21 patients (47.7%) had a value below 5. In the control group, 8 patients (21.2%) between 21-30 years were found to have poor sleep quality by age.

CONCLUSION: Sleepiness and sleep quality have physiological, social and psychological effects on individuals. There is no statistically significant difference in sleep quality and sleepiness scales between patients operated for pituitary adenomas and healthy individuals. However, it is recommended that polysomnography should be used to examine these patients in more detail.

KEYWORDS: Sleep, Pituitary Adenoma, Polysomnography

■ INTRODUCTION

Pituitary adenomas are in third place with a 10-15% incidence rate among all intracranial tumors (7). They are more common in women and in the 3rd to 5th decades. The most common type of adenoma is prolactinoma. The incidence of growth hormone (GH), adrenocorticotrophic hormone (ACTH), thyroid-stimulating hormone (TSH)-secreting adenomas and nonfunctional adenomas is low (6). Some are slow-growing lesions that can persist for years without symptoms. Some may give early clinical manifestations with hormone hypersecretion or optic chiasma compression. Some studies have reported that pituitary adenomas, particularly

acromegaly, Cushing's disease, and prolactinoma reduce the quality of life of the patient.

Sleep is one of the most important physiological requirements for humans. Besides being a state of unconsciousness that can be reversed, it is not only a state of inactivity that allows the body to rest but an active period of regeneration that prepares the whole body to live again (11). For this reason, sleep is one of the basic and indispensable daily living activities that affect the health and life quality of individuals and is a concept with physiological, psychological and social dimensions (5). Sleep disturbance can disrupt the physical and mental well-being of the patient. Sleep disorder has physical



Corresponding author: Nail Caglar TEMIZ

E-mail: ctemiz1972@gmail.com

effects such as fatigue, pain sensitivity, reduced immune status, as well as deterioration in emotional state, depression and dissatisfaction and it is a serious problem affecting the daily work and social situation (16). Some reports emphasized that patients who have been diagnosed prolactinoma have sleep disturbances and sleepwaves are slower than in healthy individuals (8). Prolactin levels are directly related to the quality of life of the patient (15). In long-term follow-up of untreated acromegalic patients, it has been shown that sleep quality of patients decreases, resulting in decreased quality of life, daytime fatigue and increased daytime sleepiness (17). Some studies show that Cushing’s disease is the cause of co-morbidity in patients with depression and anxiety (12). When the literature is reviewed, it is seen that sleep quality of patients with pituitary adenoma is deteriorated and sleepiness is increased. Polysomnography (PSG) is the most objective method used to diagnose sleep disorders. However, because of the difficulty of access to PSG and the high cost, various questionnaires are used in the diagnosis of sleep disorders. We used the Pittsburgh Sleep Quality Index (PSQI) and the Epworth Sleepiness Scale (ESS) to assess the patients in this study.

The PSQI was organized by Buysse et al. in 1989 (4), and translated into Turkish by Agargun et al.(1). PSQI assesses sleep quality and sleep disturbance over the past month. It consists of 24 questions where 19 questions are self-report questions and 5 questions are questions answered by the spouse or roommate. The 18 questions scored in PSQI consist of 7 components. These include subjective sleep quality, sleep latency, sleep duration, usual sleep activity, sleep disturbance, sleep medication use and daytime dysfunction. Each component is evaluated from 0 to 3 points. The total score of the 7 components gives the scale total score. The total score ranges from 0 to 21. If the total score is greater than 5, this indicates “poor sleep quality”.

The Epworth Sleepiness Scale is a simple, self-reported measure. It questions the individual’s sleepiness level. It aims to evaluate the chances of falling asleep or being sleepy in the case of eight different daily life situations (reading a book while sitting, watching TV, sitting quietly in a public place, traveling in a car, lying down after lunch, talking to someone else, sitting quietly without drinking alcohol after lunch, being in a car that has stopped in traffic for a few minutes). It is a simple, easy to understand, validity and reliability proven, 8-item measure for assessing the adult sleepiness level (9). Depressive mood and reduced sleep quality, which are likely predictors of quality of life in these patients, have often been neglected. The relationship between pituitary adenomas and sleep disorders has previously been shown in the literature (8,14). However, after surgery of pituitary adenomas, whether sleep quality and sleepiness of these individuals are different from those of healthy subjects has not been evaluated. Our aim, in this study, was to investigate whether sleep quality and sleepiness of patients who undergo surgery for pituitary adenomas differed from healthy individuals.

■ MATERIAL and METHODS

The study was conducted at the Gulhane Education and

Research Hospital and 44 patients who were operated for pituitary adenomas and 44 healthy individuals, 88 subjects in total, were evaluated by a questionnaire. All questionnaires and scales were applied by the same researcher without the name of the participant in order to maintain consistency. Statistical analyses were conducted with the SPSS for Windows 23.00 package program. We used the chi square test in the evaluation of the data and percent distributions were used in the comparison of qualitative variables. The means are presented with standard deviations. This study was approved by the ethics committee of our institution.

■ RESULTS

A total of 88 subjects participated in the survey. Of the 88 participants, 44 (50%) were patients who were operated because of pituitary adenomas, while 44 (50%) were control subjects. 38 (43.2%) of the participants were male and 50 (56.8%) were female. The average age of the participants was 37±12.24 years where the youngest age was 16 and the oldest age was 74 years.

Comparisons between groups were evaluated by age and sex.

Those who scored less than 5 points in the sleep quality index were rated as having good sleep quality, while those who scored more were rated as having poor sleep quality (Table I). The sleep quality index was above 5 in 26 patients (59.1%). The age group in which the sleep quality was the most impaired was 41-50 years (8 patients). In the patient group, the sleep quality index was below 5 in 18 (40.9%) patients. The age group with the best sleep quality in the patient group was 41-50 years (7 patients). In the control group, 23 patients (52.3%) had a sleep quality index above 5 and 21 patients (47.7%) had an index below 5. In the control group, 8 patients (21.2%) between 21-30 years of age were found to have poor sleep quality by age. There were 8 patients (18.2%) with good sleep quality in the control group and in the age range of 21-30 years. There was no statistically significant difference between the groups by age (p=0.333).

We distinguished the results of the Epworth sleepiness scale questionnaire by 4 groups (Table II). Those with a value of 0-10 were assessed as the 1st group, 11-14 as the 2nd group, 15-18 as the 3rd group, and 19-24 as the 4th group. Groups 3 and 4 were evaluated as having excessive sleepiness. As a result of the sleepiness questionnaire in the patient group, 31 (70.5%) patients were in the first group. By age, the largest number of patients was in the age range of 41-50 years. The number of patients in group 2 was 8 (18.2%) and the number of patients in group 3 was 3. (6.8%) There were 2 (4.5%) patients in the 4th group. Among these groups, 2 patients had excessive sleepiness and were between 40 and 60 years old. There were

Table I: Pittsburgh Sleep Quality Scale by Groups

	Pittsburgh Score	Patient	Control
Good	≤5	18 (40.9%)	21 (47.7%)
Bad	>5	26 (59.1%)	23 (52.3%)

40 patients (90.9%) in the first group and 4 patients (9.1%) in the second group while there were no patients in the third and fourth groups in the control group.

Although these results were clinically significant, there was no statistically significant difference between groups by age ($p=0.834$) (Table III).

In the patient group, 26 (59.1%) patients with poor sleep quality were identified in the PSQI evaluation according to

Table II: Distribution of Epworth Sleepiness Questionnaire According to Groups

	Epworth Score	Patient	Control
Good	0-10	31 (70.5%)	40 (90.9%)
	11-14	8 (18.2%)	4 (9.1%)
Bad	15-18	3 (6.8%)	-
	19-24	2 (4.5%)	-

sex. 11 (25%) of them were male and 15 (34.1%) were female. Of the 18 (40.9%) patients with good sleep quality, 13 (29.5%) were female and 5 (11.4%) were male. In the control group, 23 (52.3%) patients with poor sleep quality were identified in the PSQI evaluation by sex. 13 (29.5%) of them were male and 10 (22.7%) were female. Of the 21 patients with good sleep quality (47.7%), 9 (20.5%) were male and 12 (27.2%) were female.

There was no statistically significant difference between groups in the evaluation of PSQI by sex ($p=0.221$) (Table III).

In the patient group, 5 (11.3%) patients with extreme sleepiness were identified by sex-based ESS evaluation. Of these, 2 (4.6%) were male and 3 (6.8%) were female. Of the 39 patients with no sleepiness (88.7%), 25 (56.8%) were female and 14 were female (31.8%).

The control group did not have any subject with excessive sleepiness in the ESS evaluation by sex. No sleepiness was found in 44 (100%) patients and 22 (50%) in this group were female and 22 (50%) were male. Although the women in the

Table III: Distribution of the Study Group by Demographic and Clinical Characteristics

Demographic and Clinical Features	Number	%
Sex		
Male	38	43.2
Female	50	56.8
Age Group (years)		
11-20	6	6.8
21-30	26	29.5
31-40	20	22.7
41-50	23	26.1
51-60	9	10.2
61-70	3	3.4
71-80	1	1.1
Average Age (years)(mean± s.deviation)	37±12.24	
Level of Sleep Quality		
Good (≤5 Points)	39	44.3
Bad (≥ 6 Points)	49	55.7
Pittsburgh Sleep Quality Index (mean± s.deviation)	1.5568±0.49961	
Extreme Sleepiness		
Normal (0-10 Points)	71	80.7
Mild (11-14 Points)	12	13.6
Intermediate (15-18 Points)	3	3.4
Severe (19-24 Points)	2	2.3
Epworth Sleepiness Scale (mean ± s.deviation)	1.27±0.63838	

patient group were clinically worse, there was no statistically significant difference between the groups in the evaluation of ESS by sex ($p=0.902$).

■ DISCUSSION

Eighty-eight patients were evaluated in this study. Forty-four of them were operated on with the diagnosis of pituitary adenoma. Patients were assessed by sleep quality and sleepiness questionnaire at 3 month controls and it was shown that there is no difference in sleep quality and sleepiness between patients who were operated due to pituitary adenoma and healthy subjects. Sleep is the most important need of a healthy life. It is a period in which people grow, develop, learn and rest since birth and prepares the body to be healthy for the next day. Sleep, one of the basic requirements of human beings, is important for health and quality of life at all ages. Sleep is a key element in physical growth and in strengthening academic performance. It is stated that adequate levels of rest and sleep are necessary for a child to achieve developmental functions.

Sleepiness is defined as the impulse or sleep propensity that leads a person to sleep. The most common cause of increased daytime sleepiness is poor sleep hygiene or inadequate sleep due to sleep deprivation.

There are many articles on deteriorated sleep quality and sleepiness of patients with pituitary adenoma (2,8,13,15,17). We see that impaired sleep quality in pituitary adenomas reduces the quality of life of the patient and leads to problems that can lead to depression (14). Leistner et al. reported they evaluated the deteriorating performance of patients whose quality of life was impaired due to sleepiness during the day in patients who underwent pituitary adenoma surgery and there was no statistically significant difference between them and normal healthy individuals (14). In 2014, Barbosa et al. conducted polysomnography in their study of 35 patients at the 6th month controls and found that prolactinoma and hypogonadism were the predisposing factors for the obstructive sleep apnea in this study and that the sleep quality was deteriorated after medical treatment due to developing obesity in these patients with sleepiness affecting the daytime performance (2). In our study, although the sleepiness was found to be worse in 5 patients compared to the control group after pituitary adenoma surgery, it was not considered statistically significant.

Joustra et al. examined the sleep and wake rhythms of nonsecretory pituitary adenomas and Addison patients in 69 patients in 2014. It was observed that Addison patients increased their daytime activities with hydrocortisone treatment. It was also observed that hydrocortisone therapy did not affect patients with surgically treated nonsecretory pituitary adenomas. They emphasized that the function of the hypothalamic suprachiasmatic nucleus was impaired while searching for sleep-wake rhythm disturbances (10). In our study, there was no statistically significant result regarding sleep quality and wakefulness in the operated pituitary adenomas with no additional treatment, as opposed to the Joustra et al. study.

Korkmaz et al. conducted a study in 2014 and examined 15 patients with newly diagnosed acromegaly who had not been treated yet. Polysomnography (PSG) records of the patients were obtained and basal hormone levels were determined. As a result, the hormonal values of acromegalic patients were not related to sleep apnea, but patients with acromegaly showed increased sleep apnea frequency (13).

In a study of 17 patients and 17 healthy control groups with the diagnosis of pituitary adenomas, Biermasz et al. studied the sleep characteristics, sleep circadian rhythm and subjective sleep quality, scales, actinography and polysomnography in their patients (3). In the patient group, they reported that sleep efficiency was decreased, and the quality of life and fatigue-sleepiness level were increased. In our study, it was determined that sleep quality and sleepiness ratio did not change statistically, unlike the Biermasz study.

■ CONCLUSION

It should not be forgotten that sleepiness and sleep quality have physiological, social and psychological effects on individuals. Sleep tests are needed to improve the quality of life. In our study, there was no statistically significant difference in sleep quality and sleepiness scales between patients with operated pituitary adenomas and healthy individuals. However, we recommended polysomnography to be used to examine patients with a pituitary adenoma.

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