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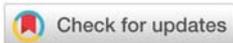
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Research Article

Quality of sleep in patients with Obstructive Sleep Apnea and Hypopnea Syndrome

Abstract

Objective: To correlate sleep quality with the severity of the patient's effort to polysomnography.

Methods: A random sample of 15 adult patients of both genders, aged 29-68 years, who were referred for polysomnography examination at a hospital in the city of Porto Alegre / RS, Brazil, were randomly selected. In addition, all the patients in the sample received a Speech and Language Pathology Assessment Protocol for OSAHS (adapted) and later the Pittsburgh Sleep Quality Questionnaire.

Results: In applying the Pittsburgh Sleep Quality questionnaire, the average score was 19.7 points (out of a total of 42 points). The women presented higher indices than the men, revealing worse quality of sleep than these. When comparing the results of the questionnaire score with the severity categories of OSAHS, no relationship was observed between the variables, with the worst scores being obtained by the patients with OSAHS.

Conclusions: We can not see the difference between the diagnoses of the polysomnography examination and the perception of sleep of the subjects, being the main clinical scores for patients with RERAs.

Introduction

At present, the diagnosis of respiratory disorders that affect sleep is becoming more and more frequent. These may present in a mild form, characterized only as upper airway resistance (RERAs) to more severe conditions, such as hypoapnea or apnea [1]. These disorders are responsible for symptoms resulting from respiratory distress, which characterize the so-called Sleep Apnea Syndrome and Obstructive Sleep Apnea (OSAHS). Although it has been described for over 40 years, it has only recently been recognized as one of the most prevalent disorders worldwide, accounting for a high rate of morbidity and mortality [2]. OSAHS is characterized by recurrent episodes of partial or total upper airway obstruction (VAS) during sleep, which occurs due to an opposition of the tongue to the lateral walls of the oropharynx and the soft palate, causing a collapse of these structures, which causes (apnea) of the airflow, despite the inspiratory effort, lasting ten seconds or more [3]. Hypoapnea is diagnosed when there is a reduction of greater than 50% in the respiratory amplitude, or alternatively when there is an association between this reduction, even though less than 50%, and oxygen desaturation greater than or equal to three percent, and / or wake up during sleep [4,5].

It is estimated that 80% of cases of OSAHS are underdiagnosed. This is because the confirmation of the existence of the syndrome is performed only through polysomnography, considered the gold standard method for diagnosis of sleep disorders [6]. The polysomnographic study is a specific quantitative examination that allows qualifying and identifying respiratory events during sleep. It monitors the physiological parameters, so that the type of apnea (central, obstructive or mixed), its severity (mild, moderate or severe), and also cardiac, respiratory and brain abnormalities are known. Normal values for adults are less than five events per hour. A mild grade disorder is characterized by mild drowsiness, mild oxyhemoglobin desaturation, and low apnea / hypoapnea index (five to fifteen events per hour of examination). The mild disturbance is characterized by moderate somnolence, moderate oxyhemoglobin desaturation, cardiac arrhythmias, and moderate apnea / hypopnea index (15 to 30 events per hour). Severe drowsiness is associated with severe sleepiness, severe oxyhemoglobin desaturation, symptoms of heart or coronary insufficiency, high apnea / hypopnea index (more than 30 events per hour). Diagnosis of the test may also reveal respiratory-related arousal (RERAs), which is a form of respiratory disorder in which increased respiratory effort

associated with sleep fragmentation occurs. Patients with RERAs do not have defined apneas or an important degree of oxyhemoglobin desaturation [7–10].

The polysomnographic examination is difficult to access to the population, both from the financial point of view and the availability of laboratory performance, during an entire night. Therefore, in general, the diagnosis is based on signs and symptoms, and there is no precise confirmation [6]. The most characteristic and prevalent symptoms of OSAHS are: high and discontinuous snoring; frequent episodes of snoring; body movement in an abrupt manner; to restore breathing; intense sweating; excessive daytime sleepiness; chronic fatigue; irritability; reduction of memory, with losses in the assimilation of new information and reduced attention, making the individual more likely to be involved in automobilical and labor accidents. The presence of daytime hypersomnia, as well as the several symptoms mentioned above, represent a significant limitation of the individual's quality of life, as well as increased morbidity and mortality from OSAHS [11–13].

Based on the theoretical assumptions presented herein, the present study aims to relate the sleep quality to the severity of the disorder presented by the patient to the polysomnography examination, in order to verify the relationship between the diagnosis given by the examination and the individuals' perceptions about of your sleep. The study of this perception is important for the treatment of snoring individuals, which should not be based only on the clinical analysis of the subject, but also on the subjectivity of the disorder and how it affects their quality of life and their relationship with others.

Methodology

This is a cross-sectional, field study, whose data collection was performed at the Laboratory of Clinical Neurophysiology of a hospital in the city of Porto Alegre / RS, from August to September of the year 2010. The sample was randomly composed, by adults of both sexes, referred for polysomnography, regardless of the complaint. All subjects signed a Free and Informed Consent Term to participate in the research, according to a project approved by the Research Ethics Committee of the institution of origin, under no. 596/10.

Data were collected before the polysomnography examination, in a specific environment. All the patients in the sample responded to a Speech-Language Pathological Assessment Protocol for OSAHS (adapted) [14], which consisted of identification data and questions related to their habits, health and aspects of sleep. Subsequent to the application of the protocol, the Pittsburgh Sleep Quality Questionnaire [15], was applied. This questionnaire is composed of 12 questions, four of which refer to the description of the patient's sleep habits (bedtime, number of hours of sleep per day, time to fall asleep and time to wake up) and eight to the perception he has about his sleep. Of these, question five, which points out difficulties in sleep, has ten sub-items. All responses have increased sleep quality scores. Thus, the lower the total score obtained in the test, the greater the quality of the individual's sleep. The two instruments used are validated internally.

From the mentioned questionnaires, the following variables were analyzed in this study: polysomnography examination result; result of the Pittsburgh Sleep Quality Questionnaire; social data – age, gender, marital status; habits and previous history – smoking, alcoholism and otorhinolaryngological diseases. Data were analyzed through tables, graphs and descriptive statistics. For the verification of significant association between the variables was used and Fisher's exact test and T-student association test, the Pearson correlation analysis was used to study the correlation between the quantitative variables. The results were considered significant at a maximum significance level of 5% ($p \leq 0.05$) and the statistical analysis software used was SPSS version 17.0.

Results

Fifteen patients participated in this study, nine of the female gender and six of the male gender. As for age, the mean was 52.6 years, with a minimum limit of 29 and a maximum of 68 years. In relation to the marital situation, 11 subjects in the sample are married, three are single and one is a widower. With regard to habits and previous life history, three subjects reported using tobacco and four used to drink socially. Seven of the subjects reported some type of otorhinolaryngological intercurrent, the most prevalent being allergic rhinitis, which affected five subjects.

As to the results obtained in the polysomnography examination, four patients presented a diagnosis of RERAs, four of obstructive sleep apnea of mild degree, 2 of moderate degree, and 5 of severe grade. When related to gender, there is a greater severity of sleep disorders in men.

Regarding the results of the Pittsburgh Sleep Quality Questionnaire, the average score was 19.7 points (out of a total of 42 points), ranging from 9 to 36 points. Women had higher indices (21.6, on average) than men (16.8, on average), showing worse sleep quality than these. When comparing the results of the questionnaire score with the severity categories of OSAHS, no relationship was observed between the variables, the worst scores being obtained by the patients with OSAHS (24,7). In order to perform the statistical analysis, the results of the Pittsburgh Sleep Quality Questionnaire were amalgamated into two groups: absence of obstructive sleep apnea (RERAs) and its presence (mild, moderate and severe) (Table 1).

As for the results of the sleep characterization of the subjects of this study, it can be seen that most sleep late (between 10 at night and 2 in the morning), with more than half of the sample (six individuals) reporting early waking, before seven in the morning. The subjects of this research sleep, on average 6.16 hours, ranging from three to nine hours per day. Most (11 subjects) report no problems getting to sleep.

Table 1: Relationship between Pittsburgh Sleep Quality Questionnaire score and presence / absence of OSAHS.

	Number	Mean	Standard deviation
Gift	11	17,9	8,8
Absent	4	24,8	10,8

Regarding the sleep habits of the patients, in relation to the month before the evaluation, most of the subjects reported difficulties regarding their quality of sleep (Table 2).

When questioned about sleep being a necessity or a pleasure, 66% of the sample answered need, not conferring upon the act of sleeping something pleasurable. In the sample, 80% reported napping during the day, and 61% did so in an unintentional manner. When asked about their feelings about the act of dozing, 60% said they were a necessity. The relationship between these results regarding sleep perception by the subjects was compared to the scores of the Pittsburgh Sleep Quality Questionnaire (Table 3).

There was a significant relationship between sleep and napper perceptions as the subject's needs and a lower mean score in the questionnaire. When questioned about what was causing problems for their sleep, the subjects responded with the frequency listed in table 4. There were no significant results when the association of these responses with the feelings about sleep and / or the score obtained in the Sleep Quality Questionnaire of Pittsburgh, by Fisher's Exact Test.

Discussion

The characterization of the sample of this research reflects, although small, the main findings of the population with OSAHS described in the literature. According to preliminary

Table 4: Frequency reported by subjects on sleep problems.

Question	Three times / no or more		One or two times		no <one time		No None	
	f	%	f	%	f	%	f	%
Take more than 30 minutes to fall asleep	7	46,7	1	6,7	2	13,3	5	33,3
Waking up in the middle of the night or early morning	3	20,0	-	-	1	6,7	11	73,3
Get up to go to the bathroom	2	13,3	-	-	-	-	13	86,7
Have trouble breathing.	9	60,0	-	-	2	13,3	4	26,7
Cough or snore very loudly	1	6,7	-	-	1	6,7	13	86,7
Feel very cold	14	93,3	-	-	-	-	1	6,7
To feel very hot	5	33,3	-	-	4	26,7	6	40,0
Have bad dreams or nightmares	7	46,7	2	13,3	3	20,0	3	20,0
To feel pain	9	60,0	-	-	4	26,7	2	13,3
Other reasons	9	60,0	-	-	5	33,3	1	6,7

studies [16–19], OSAHS is a disorder that mainly affects middle-aged men, as the majority of this sample. Another recurrent factor in OSAHS is the high weight. According to research, the severity of OSAHS and the frequency with which it occurs is related to high BMI of the individuals, ie, the higher the BMI, the greater the severity and the frequency of OSAHS [20]. The literature suggests that overweight would lead to narrowing of the pharynx, or deposition of fat on the walls of the pharynx, or parapharyngeal structures such as tongue, soft palate and uvula [21–23]. Moreover, several studies have suggested that the presence of fat around the pharynx increases its compliance, favoring collapse during sleep [21–24].

In addition, the presence of these factors may be influenced by behavioral and health issues of the individual, such as tobacco use, alcohol consumption and the presence of respiratory tract diseases, which end up making the patient's breathing difficult, especially during sleep. Studies have verified the association between smoking and alcohol in the presence of OSAHS [25]. The results of table 2 corroborate the prevalence of male subjects in the sample and indicate that these are the ones that present more serious OSAHS disorders [26,27].

For an accurate diagnosis of OSAHS, polysomnography is the most recommended examination, it is a specific quantitative exam that allows identifying and qualifying respiratory events. Monitors the physiological parameters during sleep to diagnose the type of apnea (central, obstructive or mixed), its severity (mild, moderate or severe). During the polysomnography the patient is monitored with electroencephalogram, electromyogram of the chin and legs, electro-oculogram, electrocardiogram, nasal and buccal airflow, abdominal and thoracic respiratory effort and oxygen saturation. The polysomnographic examination, besides diagnosing apnea / hypopnea, can also diagnose insomnia, narcolepsy, somnambulism and REM sleep behavioral disorder, and is considered the gold standard test for OSAHS. It is a high-cost, difficult-to-access and often uncomfortable examination for some patients because it is an overnight examination in the laboratory [28]. The data from this research also point to this direction, since a worse perception of sleep is not associated, in most cases, with a more severe sleep disorder.

Table 2: Perception of subjects regarding sleep quality.

Variable	Answer	nr	mean	SD	p
Sleep	Pleasure	5	10,6	1,5	0,003*
	Need	10	24,3	8,3	
Nap	Pleasure	6	13,8	5,1	0,044*
	Need	9	23,7	9,9	

* Statistically significant values (p≤0.05) - T-student test.

Table 3: Relationship between Pittsburgh Sleep Quality Questionnaire score and sleep quality score.

Variable	Answer	Nr cases	%
How would you rate the quality of your sleep	Too bad	1	6,7
	Bad	5	33,3
	Good	7	46,7
	Very Good	2	13,3
Took some sleeping pills on your own.	Three times a week or more	11	73,3
	Once or twice a week	1	6,7
	Not once	3	20,0
She had trouble staying awake while performing some activity that required attention	Three times a week or more	9	60,0
	Less than 1 time per week	2	13,3
	Not once	4	26,7
You felt unwell or lack of enthusiasm to perform your daily activities	Lots of	6	40,0
	Moderate	1	6,7
	Little	3	20,0
	None	5	33,3

The results of this research demonstrate that there is no significant relationship between the quality of sleep, as evidenced by the Pittsburgh Questionnaire, and the OSAHS severity index assessed by polysomnography. This finding, in addition to revealing that each individual suffers differently the consequences of this disorder, shows us that the health professional should be attentive to both issues. On the one hand, the organic diagnosis can not be made based solely on the symptoms and complaints of the patient and, on the other hand, that the way the patient deals with his disorder reveals the degree of dissatisfaction with the patient. For the health professional, it is important to have the knowledge of both sides of this situation, in order to be able to draw a diagnosis and a therapeutic plan suitable for each case.

As for sleep habits, most of the subjects in the sample sleep poorly, that is, they have sleep deprivation, which can cause serious damages, such as reductions in cognitive processing efficiency, reaction time and attentional responsiveness, and memory, increased irritability, metabolic, endocrine, immune, hypertensive, fatigue, nausea, headache, burning eyes, blurred vision, joint pain, decreased libido and somnolence. Sleep deprivation can also cause inflammatory changes in the endothelium, atherosclerotic, autonomic and metabolic, increasing the risk for systemic arterial hypertension, cardiac arrhythmias and coronary disease [29-31].

Despite the short sleep time, most (9 subjects) of this sample reported having good or very good sleep quality. However, other results indicate otherwise. Eighty percent of subjects take medication to sleep frequently. In addition, more than 70% of the sample reported that they felt drowsy while performing some activity that required attention. Daytime sleepiness is one of the worst enemies of patients who do not have good sleep quality. Studies have shown that traffic accidents caused by sleep at the wheel are more frequent in patients with OSAHS [13,32]. A little more than 60% of the sample also reported feeling unwell to perform daily tasks, referring to feeling tired to carry out the activities.

Because of all these symptoms, subjects with OSAHS, like most of this sample, regard sleep and daytime napping, often unintentional, as a necessity and not a pleasure. Healthy sleep should be a repository of the energy expended during the day's activities. In addition, it should be sufficient to carry out such activities with sufficient care and attention, avoiding accidents. The perception of sleep and nap as a necessity is significantly related to a lower score in the total score of the questionnaire, revealing that these subjects have a greater perception of the lack of quality of their sleep and point out more problems related to this in their daily life. The patient with OSAHS can not sleep adequately because apnea, even if it is not severe, causes nocturnal wakefulness, which fragments sleep and prevents necessary and sufficient rest [31]. The patient does not always perceive this situation, which may explain the fact that many of the subjects reported having a good quality of sleep, despite the complaints evidenced in the other responses of the questionnaire.

As for the problems reported to sleep, the most prevalent was the cold; however, it is believed that this response may

be influenced by the data collection period, which occurred in winter. Also noteworthy is the reference to pain, nightmares and delay in getting to sleep. Nine subjects reported difficulty breathing, which may be associated with more severe cases of OSAHS. In fact, the difficulty of breathing is an intrinsic part of this disorder and the symptom that can lead to the worst consequences of OSAHS, which can lead to death [1,2].

Conclusion

The idea that sleep is a fundamental part of one's health and quality of life has begun to grow in concern in areas that have dealt with their disorders for quite a short time. The contribution of sleep to growth, memory and the development of other cognitive abilities is undeniable. However, little was known about their disorders and much less talked about the treatment of these.

The results obtained in this research allow us to state that, for this sample, the perception of sleep quality is not directly related to the severity of the diagnosis. Therefore, for the health professionals who deal with this patient, knowing these subjective data is of fundamental importance for the therapeutic planning of each case.

More work involving, on the one hand, the issues of OSAHS and its relationship with quality of life and sleep, regardless of the pathology of origin, should be stimulated and performed. Knowing the subject's perception of the evil that afflicts him and being able to measure how the disorder affects his daily life is a fundamental and subjective task, which is not done only by diagnosis.

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