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ORIGINAL ARTICLE / ОРИГИНАЛНИ РАД

Patients' symptoms as a reason for consulting a doctor and obtaining a diagnosis of obstructive sleep apnea

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SUMMARY
Introduction/Objective Obstructive sleep apnea (OSA) is characterized by a number of symptoms of which the patient is sometimes not aware.
The aim of this study was to determine the symptoms due to which patients came to our sleep department, and to examine to which extent patients' self-awareness plays a role in diagnosing OSA.
Methods The study included 388 patients who came to the Sleep Department of the Clinic of Pulmonology, Skopje, Macedonia, from 2012 to 2016, with suspicion of OSA. Medical history was taken from all patients and polysomnography was performed in order to diagnose OSA. All patients with symptoms of OSA and Apnea–Hypopnea Index score of over 5 were diagnosed with OSA.
Results We identified a list of 23 symptoms that lead patients to visit a doctor. The most common symptom was snoring, which occurs in 86% of patients. It is followed by a feeling of under-sleeping with 68% and witnessed apnea with 63%. A total of 258 patients were diagnosed with OSA. The most important primary symptoms that led OSA-positive patients to our clinic were snoring, witnessed apnea, and daytime sleepiness. The percentage of snoring was decreasing with disease severity. Percentage of witnessed apnea and daytime sleepiness were increasing with disease severity. Self-awareness of symptoms led a majority of the patients to come to the Sleep Department.
Conclusion Patients who have symptoms such as snoring, witnessed apnea, and daytime sleepiness are likely to suffer from OSA. Most of the patients are aware of their symptoms and seek help from a doctor.
Keywords: sleep apnea; snoring; primary symptom

INTRODUCTION

Obstructive sleep apnea (OSA) is defined as an intermittent cessation of breathing during sleep [1]. Sleep apnea is characterized by the cessation of airflow of over 10 seconds up to two minutes or longer [2]. The prevalence of OSA in the world is 2–5% of the general population [3]. A growing number of authors point out that its prevalence is 5% and greater among men and 2% and greater among women [4]. According to this statistic, we can assume that there are between 40,000 and 100,000 persons suffering from OSA in Macedonia. Obstructive sleep apnea is characterized by a number of symptoms of which the patient is sometimes not aware [5]. The most common are snoring, witnessed apnea, daytime sleepiness, feeling under-slept upon waking, the weakening of intellectual abilities, dry mouth or throat in the morning [6, 7, 8]. Most of the patients had never heard of obstructive sleep apnea and had not been aware of having symptoms that may indicate this disease. Unfortunately, doctors rarely think of OSA and symptoms that patients complain of are often considered to be symptoms of other diseases. Population-based epidemiology studies and observations of OSA patients have consistently shown the prevalence of hypertension, type II diabetes, cardiovascular disease, and stroke to be higher in people with OSA [9]. The prevalence of hypertension is significantly higher in patients with OSA than the general population. OSA prevalence is especially high in patients with hypertension resistant to drugs. OSA was diagnosed in 83% of patients with uncontrolled hypertension (three or more antihypertensive drugs) [10]. The risk of myocardial infarction in patients with OSA is five times higher than the general population. Chances to survive myocardial infarction in patients with OSA are much smaller than in patients with no OSA. Seventy-five percent of patients with angiographically proven coronary artery disease have OSA [11]. Sleep disordered breathing is significantly more common in patients who have had a stroke or a transient ischemic attack than in the general population, occurring in 32–63% of stroke patients, and is associated with increased mortality and worse functional outcomes in these patients. [10]

The aim of this study was to determine the most common symptoms due to which patients with suspicions of OSA came to our Department, to identify the primary symptom for which they underwent polysomnography (PSG), and to see if there is a difference in symptoms in PSG-positive patients in comparison to negative patients. Furthermore, we wanted to examine to which extent patients self-awareness plays a role in reaching the diagnosis.

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METHODS

The study was prospective and performed at the Clinic of Pulmonology from 2012 to 2016. The study included 388 patients who came to the Sleep Department with suspicion of OSA. Medical history was taken from all the patients, after which PSG was performed on all patients. When taking patient anamnesis, data was grouped into four sets. The first set of information included standard data for age and sex. The second set of collected data included information about all OSA symptoms such as snoring, witnessed apnea, daytime sleepiness, morning dry mouth or throat, feeling under-slept in the morning, and others. The third set of collected data included information about the primary symptom and was classified as a distinct category of data information. Primary symptom was defined as a single primary issue that led patients to the hospital. Fourth set of information included data of patient's self-awareness of symptoms. OSA was diagnosed by PSG, which represents the golden standard for the diagnosis [12, 13]. In this study we used Respironics Alice 5 Diagnostic Sleep System polysomnograph (Koninklijke Philips N.V., Amsterdam, the Netherlands). All results from PSG were scored manually according to standard criteria. Apnea, hypopnea and arousals were also identified according to the standard criteria [14]. All results were summarized according to the Apnea–Hypopnea Index (AHI). All patients with symptoms of OSA and AHI score of over 5 were diagnosed with OSA [13].

RESULTS

The study included 388 patients, who came to the Sleep Department with suspicion of OSA. The average age was 44.8 ± 13.7 years, and 301 were males and 78 females. Medical history was taken from all patients with suspicion of OSA, and PSG was performed on all of them in order to diagnose OSA. All the patients with symptoms of OSA and AHI score of over 5 were diagnosed with OSA. A total of 258 patients were diagnosed with OSA with AHI > 5 per hour, 107 patients had negative AHI < 5 per hour, 18 patients were diagnosed with respiratory effort-related arousals (RERA), obesity-hypoventilation syndrome was found in four patients, and one patient had central sleep apnea (CSA). Patients with RERA, CSA, and obesity-hypoventilation syndrome were not taken into account in statistical analysis.

We identified 23 symptoms that led the patients to the Sleep Department. Twelve most common symptoms are listed in Table 1. The most common symptom was snoring, which occurred in 86% of the patients, followed by a feeling of under-sleeping, with 68%, and witnessed apnea, with 63%. The remaining 10 symptoms (headache, dizziness, bruxism, stuffy or blocked nose, nose bleeds, restless legs, numbness in hands and feet, excessive dreaming, regurgitation of food, and nightmares) occurred in less than 1% of cases and are not listed in Table 1.

After PSG, the patients were divided into two groups. The first group included patients with negative PSG with AHI < 5, and the second group included patients with positive PSG with AHI > 5, whom we diagnosed with OSA. Table 2 shows six most common symptoms that we found in booth groups.

Table 1. Percentage of 13 most common symptoms for all patients with clinical suspicion of OSA who presented at the Sleep Laboratory before they underwent overnight PSG

1.	Snoring	86%
2.	Feeling of lack of sleep in the morning	68%
3.	Witnessed apnea	63%
4.	Daytime sleepiness	55%
5.	Abrupt awakening from sleep because of choking	38%
6.	Abrupt awakening not associated with choking	29%
7.	Inability to fall asleep	21%
8.	Dry mouth and/or throat in the morning	20%
9.	Fatigue	19%
10.	Short sleep	18%
11.	Anxiety	15%
12.	Chest pain	9%
13.	Fear of falling asleep	5%

OSA – obstructive sleep apnea, PSG – polysomnography

Table 2. List of most common symptoms in patients with and without OSA

	OSA negative AHI < 5	OSA positive AHI ≥ 5
1.	Snoring	Snoring
2.	Abrupt awakening not associated with choking	Daytime sleepiness
3.	Feeling of lack of sleep in the morning	Witnessed apnea
4.	Inability to fall asleep	Feeling of lack of sleep in the morning
5.	Anxiety	Abrupt awakening from sleep because of choking
6.	Daytime sleepiness	Dry mouth and/or throat in the morning
7.	Other	Other

OSA – obstructive sleep apnea, AHI – Apnea–Hypopnea Index

We identified primary symptoms for all the patients and we attempted to classify the primary symptoms as a distinct category. Primary symptom was defined as a single primary issue that led patients to the hospital. In fact, most patients could clearly identify their primary symptom. A smaller number of patients had two or more symptoms. In these patients we had to identify only one major symptom that we considered to be primary. For example, if a patient had snoring, witnessed apnea, daytime sleepiness, and a feeling of under-sleeping in the morning but his wife told him that he had been suffocating while sleeping and that is the reason he is visiting a doctor, then witnessed apnea was registered as the primary symptom. Or if we had a patient who complains of abruptly awakening from sleep, cannot fall asleep, and experiences anxiety, and the main reason for visiting a doctor was abrupt awakening from sleep, then we took this symptom as the primary one. The most common primary symptom for all the patients was snoring, with 31%, followed by witnessed apnea, with 25%, abrupt awakening from sleep because of choking, with 19%, etc. (Table 3)

Table 3. Percentage of primary symptoms for all patients with clinic suspicion of OSA who presented at the Sleep Laboratory before they underwent overnight PSG

1.	Snoring	31%
2.	Witnessed apnea	25%
3.	Daytime sleepiness	19%
4.	Abrupt awakening from sleep because of choking	18%
5.	Abrupt awakening not associated with choking	9%
6.	Inability to fall asleep	6%

OSA – obstructive sleep apnea, PSG – polysomnography

Table 4. Primary symptom that occurs in different groups according to the severity of OSA

Severity	Snoring	Witnessed apnea	Daytime sleepiness	Other
AHI (5–14)	65.8%	12.2%	7.3%	14.7%
AHI (15–30)	60.1%	17.7%	13.5%	8.7%
AHI (> 30)	29.2%	34.8%	27.8%	8.2%

OSA – obstructive sleep apnea, AHI – Apnea–Hypopnea Index

Table 5. The primary symptom that occurs in patients with AHI <5

OSA severity	Snoring	Abrupt awakening not associated with choking	Feeling of lack of sleep in the morning	Inability to fall asleep	Other
AHI < 5	43.9%	23.4%	13.1%	10.3%	9.3%

AHI – Apnea–Hypopnea Index

Table 6. Motivation for patients to seek help from a doctor

1.	Patients aware of their symptoms seeking help	72%
2.	Patients unaware of their symptoms, but alerted by their partner	22%
3.	Patients unaware of their symptoms, but alerted by the media	4%
4.	Patients unaware of their symptoms, but alerted by their doctor	2%

After PSG, we divided the patients into two major groups. The first group comprised patients with AHI < 5 (negative PSG in 107 patients), and the second group comprised patients with AHI > 5 (positive PSG in 258 patients). Patients who were diagnosed with OSA according to the severity of AHI were divided into three groups. In the first group with mild OSA (AHI ≥ 5, but < 15 per hour) there were 41patients (15.9%). In the group with moderate OSA (AHI ≥ 15, but < 30 per hour) there were 23 patients (8.9%), and in the group with severe OSA (AHI ≥ 30 per hour) there were 194 patients (75.2%).

Table 4 presents the percentage of primary symptoms in different groups of patients divided according to severity of OSA. We found that snoring as the primary symptom is highest in mild OSA, and is decreasing as severity of OSA increases, while the results are opposite with witnessed apnea and daytime sleepiness as a primary symptoms.

Results from 107 patients with AHI < 5 are shown in Table 5. The most common primary symptom in this group of patients was snoring, with 43.9%, followed by abrupt awakening not associated with choking, with 23.4%, and a feeling of under-sleeping in the morning, with 13.1%.

The results that we collected from all 388 patients which refer to the question if they were aware of their symptoms are shown in Table 6. The majority of patients (72%) had been aware of their symptoms, while the percentage of patients who were "forced" to go to the doctor by their partners and had not been aware of their symptoms amounted to 22%. Four percent of patients had not been aware of their symptoms but were alerted by the media and come to our department. Two percent of patients had not been aware of their symptoms, but the symptoms were discovered by their doctors, who referred the patients to our department.

DISCUSSION

Most of patients had never heard of OSA and do not know that they have symptoms that may indicate this disease. Unfortunately, doctors rarely think of OSA and symptoms that patients are complaining of are often considered to be symptoms of other diseases [15]. Franklin et al [3] pointed out that OSA is primarily regarded as a male disorder, which is comparable with results of our study. Almost 80% of patients that we included in this study were male. OSA is characterized with a number of symptoms. From the study we can see that we identified 23 different symptoms. The most common symptoms are snoring, a feeling of under-sleeping in the morning, witnessed apnea, and daytime sleepiness. Once we separated OSA-positive and negative patients, we found that snoring is the most common symptom in booth groups. Myers et al. [12] pointed that snoring is the most common symptom in sleep apnea patients but is not useful for establishing the diagnosis.

But after snoring we have difference in order of appearance of symptoms in booth groups. In the negative OSA group, symptoms that followed snoring were abrupt awakening from sleep not associated with choking and feeling under sleeping in the morning. In the positive OSA group next following symptoms were witnessed apnea, daytime sleepiness. We have similar results with primary symptoms. Most common primary symptoms in all patients were snoring, witnessed apnea, daytime sleepiness, abrupt awakening from sleep because of choking, abrupt awakening not associated with choking and cannot fall asleep. Most common primary symptoms in patients with OSA were snoring, witness apnea and daytime sleepiness. The percentage of snoring as the primary symptom reduced, as severity of the OSA increased. While the percentage witnessed apnea and daytime sleepiness was increasing, as severity of the OSA was increasing. In the study of Li et al. [16], the most common primary symptom is witnessed apnea with 32.9% and then snoring followed by 28.9%. In the same study, patients with AHI > 30 have daytime sleepiness as most common primary symptom, followed by witnessed apnea and snoring. Myers et al. [12] pointed out that the most useful observation for identifying patients with obstructive sleep apnea was witnessed apnea. The most common primary symptoms in patients with AHI < 5 were snoring, abrupt awakening from sleep not associated with choking, a feeling of under-sleeping in the morning, and inability to fall asleep. In these patients, the

symptoms are likely due to other diseases and we should conduct research in other directions as well. The differences in primary symptoms are obvious, and they might lead the doctor to suspect which patient will be positive or negative to OSA. From the results we obtained from medical history questionnaires, in which patients were asked about the motivation to seek help from a doctor, we can conclude that 72% of the patients were aware of their symptoms. Arnardottir et al. [17] reported that in a middle-aged general population, approximately 20% of subjects had moderate-to-severe OSA, but the majority of them were neither symptomatic nor sleepy and did not have impaired vigilance. We can also conclude that doctors only in a minority of patients, amounting to only 2%, had a suspicion that the symptoms are due to OSA. Although this percentage is very low, Rosen et al. [18] published that the prevalence and recognition of sleep disorders in a community-based outpatient health setting was 0.1%. Patients lose a lot of time before a doctor recognizes the disease and refers them to a sleep disorder department [19]. We had 4% of patients who were not aware of their symptoms but were alerted by media and came to our department. Public awareness of this widespread disease will rise with its presence on television and in printed media, and many patients will come to the right place on time. The majority of papers like this one stress the need for more education of general and clinical physicians. In this way they will recognize the disease early enough to diagnose OSA and to provide proper treatment to OSA patients [20].

CONCLUSION

In the group with confirmed OSA, the most common symptoms were snoring, apnea confirmed by a witness, and daytime sleepiness. In the OSA-negative group, in addition to snoring, the most common symptoms were suddenly waking up from sleep not associated with suffocation, a feeling of lack of sleep in the morning, and inability to fall asleep. Many patients are aware of their symptoms and seek help from a doctor. Greater education of hospital doctors and doctors in the primary health care in recognizing the symptoms of OSA are needed if patients are to be promptly referred for diagnosis and treatment.

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Симптоми због којих се пацијенти обраћају лекару за дијагностиковање опструктивне ноћне апнее

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САЖЕТАК

Увод/Циљ Опструктивна апнеја се јавља у току сна (ОАС) карактеришу је симптоми којих понекад ни сам болесник није свестан.

Циљ ове студије је да одреди симптоме због којих се пацијент јавља и да се испита до ког степена самосвесност пацијента има улогу у дијагностиковању ОАС.

Методе У студију је било укључено 388 пацијаната који су се јавили на Одељење за медицину спавања на Клиници за пулмологију у периоду од 2012. до 2016. године, а код којих се посумњало на ОАС. Пацијентима је узета анамнеза за ОАС и урађена је полисомнографија. Свим пацијентима са симптомима ОАС и код којих је апнеја-хипопнеја индекс (АХИ) био изнад 5 дијагностикована је ОАС.

Резултати Идентификована су 23 симптома због којих су се пацијентици јавили лекару. Најчешћи симптом је хркање (86% случајева). Затим следе осећај ненаспаваности (68% случајева) и апнеја регистрована од сведока (63%). Код 258 пацијената је дијагностикована ОАС. Најчешћи примарни симптоми били су хркање, апнеја регистрована од сведока и дневна поспаност. Проценат хркања се смањивао са тежином болести. Проценат апнеје регистроване од сведока и дневна поспаност су се повећавали са тежином болести. Највећи број пацијената се јављао јер су свесни својих симптома.

Закључак Код пацијената који имају симптоме као што су хркање, апнеја регистрована од сведока и дневна поспаност постоји велика вероватноћа да болују од ОАС. Велики део пацијената је свестан својих симптома и тражи помоћ лекара.

Кључне речи: апнеја у спавању; хркање; примарни симптом