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Original Research Article

Danger in traffic: patients with obstructive sleep apnea syndrome

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ABSTRACT

Background: Author aimed to investigate the presence of a driver's license of patients with sleep apnea and obstructive sleep apnea syndrome (OSAS) and to prevent them from going into traffic until they are treated.
Methods: In this study 645 hospitalized patients in the sleep lab for one night in 2017-2018 for polysomnography (PSG) test were questioned. We compared Apne Hipopne Indexes (AHI) and Body Mass Indexes (BMI). Patients who have risk for traffic accidents were identified.
Results: Total 424 (66%) of 645 patients were above AHI> 15, moderate and severe Obstructive Sleep Apnea Syndrome (OSAS) was diagnosed. 221 patients (34.3%) obtained a driver's license because they have mild OSAS (The AHI <15). 162 patients with AHI 15-30 (25.1%) had severe OSAS with medium OSAS and 262 patients (40.6%) had AHI> 30. Also, 410 patients with a driver's license in 645 patients had BMI> 25 kg/m^2 in 373 (91%). 340 (83%) of 645 patients with a driver's license were male; 70 (17%) of them are women. All of those with a heavy vehicle license are men and the number is 110.
Conclusions: To prevent possible traffic accidents, driver patients with OSAS detected by a polysomnography test should be withdrawn from the driver's license until they receive treatment and receive an updated health report.

Keywords: Continuous positive airway pressure, Obstructive sleep apnea syndrome, Polysomnography, Sleep apnea

INTRODUCTION

Sleep apnea is a disease characterized by respiratory arrest during sleep. These patients experience respiratory blockages while breathing in and out overnight. Accordingly, headaches in the morning, excessive fatigue and falling asleep occur during the day.[1,2] The diagnosis is made in the sleep laboratory.[3]

A report of World Health Organization (WHO) claimed about 1.35 million injuries worldwide due to traffic accidents in 2016. There are 3 times more deaths in low income countries when compared with high-income countries.[4] The cost of traffic accidents was calculated as more than £1 million.[5]

A driver should have various skills like alertness, eye to hand coordination and high cortical functions.[6] Fatigue drivers and slepiness are the major risk factors for traffic accidents.[7,8] Alone drivers or long distance drivers and also those with untreated sleep disorders have higher risks for traffic accidents.[9]

According to the of the highway traffic law, regarding obstructive sleep apnea syndrome, those with severe apnea (AHI> 30 / hour) or moderate apnea (15 <AHI <30) Those who have been diagnosed with sleepiness during the day cannot get a driver's license without treatment. Sleep apnea is brought under control or treated; People identified by at least one sleep-certified doctor (chest diseases, psychiatry, neurology, ENT

specialist) and an ENT specialist, triple committee, may be given a driving license. Considering the severity of the disease, response to treatment, compliance with patient Positive Airway Pressure (PAP) treatment; Whether it can get the second group of driving license classes and whether it can use an ambulance, an official or commercial vehicle is specified in the report. People with a body mass index of 33 kg/m^2 and above are asked to have a polysomnography test all night regardless of their complaints. People with witnessed apnea and daytime sleepiness are asked for a nightly polysomnography test regardless of their body mass index.[10]

OSAS can develop after getting a driver's license in healthy people, due to weight gain, the advancement of age, consumption of drugs, cigarettes, and alcohol over time. As such, they go into traffic without treatment. For this reason, all health institutions that carry out a polysomnography test should be obliged to report the test results to the Ministry of Interior Citizenship and Population Directorate. It is necessary to revoke the driver's license until these people receive treatment and receive the updated health report. The revocation application of the driver's license is also a method applied until certain conditions are met in some people whose criminal record is broken.[11]

METHODS

This research was carried out by retrospectively analyzing all 645 polysomnography results performed in 2017 and 2018 at the Beykoz State Hospital Sleep Laboratory. Gender, age, AHI and BMI results of the patients were obtained. Afterward, the presence of the driver's license documents of the patients' identity numbers was questioned in the Citizenship and Population Directorate. It was recorded what type of driver's license the patients found to have a driver's license. AHI and BMI results of these people were compared. A statistical study was carried out considering age and gender distributions.

While evaluating the findings obtained in the study, SPSS 15.0 package program (SPSS Inc., Chicago, USA) was analyzed for statistical results. An Independent sample T-test chi-square test was used for comparisons between groups. It was shown with frequency and percentage distributions in the evaluation of qualitative data. Of the results, those with p <- 0.05 were considered statistically significant.

RESULTS

In this study, 424 (65.7%) of 645 patients were in the Obstructive Sleep Apnea Syndrome (OSAS) group, who could not obtain a driver's license because they were above AHI> 15. Of these 645 patients, 162 patients with AHI 15-30 (25.1%) were moderate; 262 patients (40.6%) with AHI> 30 were found to have severe OSAS. 221 patients (34.3%) with the remaining AHI <15 can obtain a driver's license because they are in the mild OSAS group (Table 1). In this study, the number of obese patients with OSAS is 419. It constitutes 65% of the total working group. It was determined that 596 patients (91%) had BMI> 25 kg/m^2 (Table 2).

Table 1: Patients' driving license situation according to AHI.

AHI	N	Percentage	Driving license		p
			+	-	
15↓	221	34.3	135	85	0.72
15-30	162	25.1	105	57	
30↑	262	40.6	170	93	

Table 2: BMI distribution of patients.

BMI		N	Percentage
0-19 kg/m^2	Weak	4	0.6
20-24 kg/m^2	Normal	45	7.0
25-29.9 kg/m^2	Overweight	177	27.4
30-34.9 kg/m^2	Obese	215	33.3
35-39.9 kg/m^2	Excessively obese	122	19.0
40 kg/m^2	Morbid obese and above	82	12.7

Statistically 387 (60%) of the patients were male; it is 258 (40%) women. The average age is 49.44. The number of those with a driver's license is 410 (64%). 340 of them are male; 70 of them are women. All of the people with a heavy vehicle license are men and the number is 110 (Table 3, 4).

Table 3: Patients' driving license situation according to BMI.

BMI	Driving license		p
	+	-	
0-19 kg/m^2	2	2	0.000*
20-24 kg/m^2	35	10	
25-29.9 kg/m^2	139	38	
30-34.9 kg/m^2	142	73	
35-39.9 kg/m^2	63	59	
40 kg/m^2 and above	29	53	

Table 4: Gender discrimination of patients with a driver's license.

Gender	n	Percentage	Driving licence +
Female	258	40.0	70
Male	387	60.0	340

DISCUSSION

Insomnia is one of the most important factors that increase attention loss. Those who need sleep get tired more quickly while driving, and over time, their attention

decreases and falls asleep at the wheel. A sleepy and tired driver cannot instantly detect and evaluate information from the environment. As a result, it cannot respond fast enough to prevent an accident in case of danger. Thus, it can cause a traffic accident.[8] Daytime insomnia in these patients leads to fatigue and a decrease in concentration. It negatively affects the quality of life by disrupting professional and social responsibilities.[12]

Apnea is the breathing of air for at least 10 seconds. Hypopnea is a decrease of 30% or more in the airflow that takes 10 seconds or more. Apnea-Hypopnea Index (AHI) is the number of apnea and hypopnea per hour during sleep. Having apnea-hypopnea index 5 or more makes the diagnosis of sleep apnea. AHI is divided into three according to its severity: Light (5 <AHI <15), medium (15 <AHI <30), heavy (AHI >30).[12]

Accordingly, those with moderate to severe apnea cannot obtain a driver's license. Later on, OSAS may develop due to weight gain in the body, advancing age, and consumption of drugs, cigarettes, and alcohol. Therefore, since the polysomnography test results of patients with moderate or severe apnea are not reported to the Citizenship and Population Directorate of the Ministry of Internal Affairs, these people who have been trafficked with a driver's license while they were healthy may cause traffic accidents. As a result, the driver's license of patients with OSAS developing a driver's law should be changed until treatment. Most of our patients (40.6%) had AHI >30.

It is characterized by obstructive sleep apnea, recurrent apnea, and hypopnea episodes. This occurs with obstruction of the upper airways during sleep. It is often associated with cardiovascular complications.[13] There is a need for diagnosis and treatment by performing sleep apnea screening to reduce the cardiovascular risk in the general population with a high rate of OSAS, hypertensive patients, especially those who are obese and patients resistant to hypertensive treatment. For the diagnosis of patients with sleep apnea, polysomnography (PSG) test is routinely required.[14]

In a study sleepiness during the daytime in 46% of 1149 patients with mild and moderate sleep disturbance (AHI > 15) aws reported. Besides, these individuals have respiratory disease, sleep restriction, insomnia, and nocturnal leg complaints, leg cramps.[15] In a study it reported that in the sleep apnea syndrome, the incidence and morbidity of hypertension, coronary heart disease, arrhythmia, heart failure, and strokeis preceise.[16]

Motor vehicle accidents are mainly multifactorial, and sleepiness or sleep apnea may or may not have a role in accidents. In a study of 460 people, researchers reported that there was an increase in accidents in patients with AHI> 40 and that OSA treatment could be important in practice.[17]

Body Mass Index (BMI) is the ratio obtained by dividing body weight by the square of the height. BMI is divided into 6 groups among themselves. 0-19 kg/m^2: Weak; 20-24 kg/m^2: Normal; 25-29.9 kg/m2: Overweight; 30-34.9 kg/m^2: Obese; 35-39.9 kg/m^2: Excessively Obese; 40 kg/m^2 and above: Morbid Obese Overweight is more common among men than among women but obesity is more common among women.[18] Accordingly, 596 (92%) of our patients were found to have BMI> 25 kg/m^2, which is, above the normal weight. BMI> 25 kg/m^2 and the number of people with a driver's license is 373. A total of 373 normal kilos of drivers among 410 competent drivers in total accounted for the high rate of 92%. In other words, it shows how big the danger is. Most of our patients had BMI more than 25 kg/m^2 similar to this study.

Obesity is the most important predisposing factor that increases the risk of developing OSAS.[3] Obesity is a major public health problem and its prevalence is increasing. OSAS is also increasing as a result of increased obesity. OSAS in obese people may also affect the pathogenesis of hypertension. It is also associated with cardiovascular and metabolic abnormalities. In obese and OSAS patients, insulin resistance develops, sympathetic activity increases, renal function decreases, renin-angiotensin system rises, the baroreflex is impaired, hyperleptinemia and endothelial dysfunction develop, oxidative stress increases, systemic inflammation occurs. As a result, hypertension is added to the table.[19] It is associated with a decrease in arterial oxyhemoglobin saturation and / or changes in electroencephalography.[20]

Major risk factors for snoring were reported as male gender, being over 40, the presence of obesity, smoking, and alcohol use.[21] Schwartz et al. Reported that obesity has an important role in the pathogenesis of OSAS patients. For this purpose, they followed 13 obese patients with diet and slimming methods for 1.5 years and as a result, BMI decreased from 42 kg/m^2 to 35 kg/m^2 (17% reduction); They found that AHI decreased from 83 to 33 (60% reduction).[22]

Thus, obese and / or OSAS patients, whose driver's license will be temporarily taken away, can be made normal as a result of OSAS surgery, doing sports and diet programs and losing weight and / or when necessary. If necessary, it is necessary to use the Continuous Positive Airway Pressure (CPAP) device to ensure that patients sleep well. These patients can get their driver's license back after they are treated.

There is a significant increase in the risk of car accidents in non-commercial drivers with Sleep apnea. In studies, there is no consistent finding that the severity of sleep apnea and daytime sleepiness is related to the risk of accidents. With successful treatment of sleep apnea, drivers' performance improves. Physicians should train patients with sleep apnea on the importance of treatment for safe driving.[23]

The existence of OSAS and other sleep disorders are important risk factors for accidents, 79 patients with OSAS injured in an accident in a study. OSAS consultation should be requested for all persons with increased BMI, male gender, and advanced age (higher age), which are symptoms that suggest OSAS in regular health examinations.[24]

Patients with OSAS that are undiagnosed and untreated may cause cardiovascular diseases, stroke, metabolic diseases, daytime sleepiness, workplace errors, traffic accidents and death due to abnormal physiological changes. These results impose an economic burden, so they said that both health and social consequences and costs can be reduced with the diagnosis and treatment of sleep apnea.[25]

Authors should draw attention to the prevalence of the disease, which affects the quality of life of the patient with OSAS and can lead to mortality.[26] The presence of obesity is one of the risk factors for OSAS. Hypertension may develop with obesity in adult patients with OSAS.[22]

In a study researchers asked licensed drivers with a history of snoring and excessive daytime sleepiness who had undergone polysomnography (PSG); PSG results of 2387 patients (2171 male and 216 female) diagnosed with OSAS and having a driver's license were reviewed and 394 subjects were diagnosed as simple snorers (AHI <5) (303 male and 91 female) by PSG. In patients with severe OSAS, it has been determined that they cause car accidents by falling asleep or sleepiness.

The accident rates for falling asleep while driving in the severe and very severe group were1.5 and 2.6 times higher than the rate for the simple snorers (9.8% [77/790] in the severe group and 16.9% [82/484] in the very severe group vs. 6.4% [25/394] in the simple snorers; p <0.05, 0.01, respectively). Also, groups with AHI> 30 were significantly older than simple snorers.[27]

Obstructive sleep apnea increased the risk of motor vehicle accidents and found that this risk could be reduced with the use of CPAP. They found that there was a significant improvement in 2-7 days with CPAP treatment and that the daytime sleepiness improved even on the first day.[28]

On the other hand, negative developments in which sleep disorders can not be diagnosed frequently and consequently applied to the police centers, which affect their health and public health. As a result, screening programs should be made to detect sleep disturbance and they said that these risks will decrease with treatment.[29]

The prevalence of patients with OSA is high in society and that the adult population has 9%-38% OSA. It is more common in people with high BMI, in the elderly and men (13% -33%). In women, it is 6% -19%.[30]

In a study, 424 adults and the control group were compared. It was observed 1.5-4 times more in sleep-related traffic accidents. It was determined that those with severe apnea had twice as many accidents as those with mild and moderate apnea. In motor vehicle accidents associated with sleep, there is a danger both to the driver falling asleep and to other people in traffic. Therefore, it is necessary to treat these patients.[31] OSAS most often increases the risk of traffic accidents.[32]

CONCLUSION

Insomnia will cause contradictions in daily life, if this person is a driver. It will inevitably cause traffic accidents. To prevent possible traffic accidents, patients with OSAS should have OSAS surgery as a result of the otorhinolaryngology examination, they should lose weight with regular sports exercises and diet programs.

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