



SLEEP - DISORDERED BREATHING

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Abstract : Sleep constitutes an important biological function and occupies a large part of peoples' life. Sleep, is necessary to allow human body to carry out all normal functions and get a normal life. The deprivation of sleep and his general disorders, tend to become one of the moderns' man major problems. The modern lifestyle is the reason why more and more people are suffering from sleep disorders and mainly from breathing disorders during sleep, which can be sometimes very dangerous. Due to lack of time and lack of rest, people often do not enjoy the sleep they needed for their revitalization. The purpose of this retrospective study is to explore the during the sleep respiratory disorders.

Key - words: disorders sleep, breathing, sleep apnea, hyperpnoea and snoring

I. INTRODUCTION

Sleep is not a luxury, but an imperative for the human body. Unfortunately, it is not such an easy task for everyone, as sleep disturbance and insomnia tend to become some of the major problems of modern man. [1] When individuals fail to obtain adequate duration or quality of sleep, they may experience reduced performance, measurable changes to different organic systems, especially to cardiovascular system and, increased risk for accidents and death." [2]

Sleep is necessary for the relaxation of the nervous and muscular system, for the consolidation of memory and the restoration of cellular functions in the brain and throughout the body. But some disorders can cause significant sleeping problems such as breathing sleep disorders. [3] The definition of "sleep – disordered breathing" (SDB) refers to a wide range of diseases which lead to abnormal breathing during sleep. Breathing disorders during sleep are known since ancient times. In recent years, they are a subject of intense medical interest [4]

At least 5% of Greek population suffers from Obstructive Sleep Apnea Syndrome (OSA), a disorder which characterized by recurrent episodes of full or partial airway obstruction during sleep, which appear with apnea or hyperpnoea with simultaneous reduction of oxygen saturation, owing to insufficient alveolar ventilation [5] The appearance of the syndrome is more common in men over 40 and women after menopause, it happens regardless of age and sex [6]

The OSA caused by the temporary closure of the pharynx during sleep, resulting repeated episodes in which breathing stops completely and then suddenly resumes as the lungs struggle to receive oxygen [7] The main symptom is snoring, which starts with a loud noise and followed from a period of silence in which breathing stops from 10 seconds to 2 minutes. Silence interrupted by a loud snoring which partially or fully awakens the patient in order to restore breathing, which in this way is restored and as the patient begins to sleep again the process is repeated [8, 9] Other symptoms are the lack of refreshing sleep, frequent urination, morning headache, restless sleep, frequent awakenings

during the night, irritability and depression. Reduction of recent memory and centralized capacity. Finally, poor performance at work or school, reduced sexual interest [4, 8]

II.AIM

The purpose of this retrospective study is to identify the breathing disorders during sleep, their risk factors and symptoms, as well as the role of nurses and health professionals.

III.METHODS

Study material has been recently articles on the subject, were found mainly in the electronic database Medline and the Association of Greek Academic Libraries (HEAL – link), with the following keywords: disorders, sleep breathing, sleep apnea, hyperpnoea and snoring. Articles exclusion criterion was the language than the Greek and English.

IV.SLEEP APNEA

Sleep apnea is a serious sleep disorder, a disorder which disturbs sleep and cause daytime sleepiness. As apnea defined the complete interrupt of breathing, ie the air input from the nose and mouth, and detected by a pressure sensor or a heat sensor, and which lasts at least 10 seconds and can be repeated regularly during the night [10]

Apnea is classified as obstructive when accompanied by respiratory effort, i.e. activity of respiratory muscles, chest or abdomen movements. If apnea is not accompanied by respiratory effort, ie recorded cessation of respiratory muscle activity, it is designated as central. An apnea which begins as central and ends as obstructive, characterized as mixed apnea. Mixed apneas considered as an obstructive of variant apneas [11]

Most common symptoms of sleep apnea are snoring and choking, which may result in vigilance during the night. Apneas' syndromes risks are very serious, as they can lead to heart attacks, headaches and chronic tiredness. Sleep apnea can result in concentration and memory problems and its associated with depression and bad mood [12, 13]

Diagnosis of sleep apnea is based on the symptoms during the day and an overnight sleep monitoring , where recording the short interruptions of breathing. This recording can be done by various methods, including polysomnography or the home monitoring of sleep with fewer machines, such us a single finger detector (oximeter) for monitoring the breathing pattern and changing oxygen levels blood during the night [14, 11]

Sleep apnea in mild cases, treated by losing weight, smoking cessation and the limitation of alcohol consumption on a glass per day. In severe cases, when occurred 15 apneas lasting more than 10 seconds per hour in adults and up to 8 seconds in children, the problem is treated by using a special denture which must be wearing by the patient during the sleep. In more severe cases, ie when the number of apneas exceeds 15 per hour, treatment including the using of a CPAP ventilation device [15]

V.HYPERPNOEA

As hypopnea defined the reduction of at least 30% of the air flow or the abdomen and chest movements compared to the basal level which lasts at least 10 sec and accompanied by a decrease in oxyhemoglobin saturation by at least 4% and decrease of the saturation by 4% compared with basic SpO₂% before the episode [11] Alternatively as hyperpnoea can characterized the respiratory event which fulfills the following criteria. Reduction of the air flow by 50% of the base value as detected by the sensor of nasal pressure or alternatively by inductive plethysmographic sensors or oronasal heat sensors which takes at least 10sec and accompanied by a drop in saturation by 3% compared with the basic SpO₂% before the episode or the episode can be accompanied by waking [16]

VI.SYMPTOMS

Breathing disorder symptoms in sleep distinguished in two categories: the symptoms that occur during waking and symptoms that occur during sleep. [17] Symptoms exhibited by the patient during wakefulness are dry mouth, headache, and dizziness. The patient feels that sleep is not sufficient and he has not been rest so in the morning feels sleepy. Initially appeared in a light form but with the passage of time there are dramatic changes that can adversely affect the professional and social life of this person. He is likely to sleep during driving causing accidents [10]

In advanced cases appeared a reduce of memory capacity concentration and attention. Due to the emergence of the above symptoms may occur psychological problems usually as irritability, depressive reaction and anxiety. Men often experience impotence problems. Patient usually is a person of increased body weight, increased deposition of adipose tissue in the cervix, he is often hypertensive and rarely shows polyglobulia and leg swelling [18]

As for the symptoms during the sleeping patient has snoring. Snoring gradually deteriorates and it is observed the appearance of the first pauses of breathing, which last a few seconds and solved with a sudden resumption of the snoring. The pauses of breathing, gradually increasing in number and duration and can exceed one minute. These pauses can be realized by the familiar persons of patients. In obstructive apnea the patient tries to breathe with gradually increasing inspiratory movements resulting an asynchronous abdomen - chest movement [8]

Usually sleep is restless, with sudden movements of the trunk and limbs. At times presented full awakenings with a choking feeling. Also sweats during the night which are due to restless sleep and intense respiratory efforts. Patients rarely have involuntary urine loss. Nocturnal urinary frequency is another symptom due to the hypersecretion of atrial natriuretic factor, caused by the dimension of the sinuses and the bladder pressure due to increasing intraabdominal pressure [18]

VII.SNORING

Snoring is called the respiratory noise output during sleep, emanating from vibration of the pharyngeal wall. Snoring is a serious medical and social problem afflicting approximately 40% - 60% of adults who snore either permanently or occasionally. The combination of snoring and pauses of breathing during sleep appeared in 2.5% of the population. Snoring is caused by vibration of the larynx molecules within the air passage, particularly uvula, palate and tonsils. The main anatomical obstacles that can cause narrowing of the upper respiratory tract and therefore snoring is diaphragms' scoliosis and hypertrophic nose conchas, adenoids in the nasopharynx, hypertrophic tonsils, hypertrophic or long uvula and narrow arches in the soft palate [19]

Predisposing factors are the different fat distribution and thus the more frequent occurrence in men than women. Also elderly people snoring more frequently because the muscle tone of the pharynx muscle, uvula, and palate decreasing with age, resulting the concurrence of the airway walls. In addition, obese people with short neck are more prone to snore. Finally, has been observed that alcohol, coffee and the number of cigarettes per day affecting the occurrence of snoring [8, 20]

The main symptoms of the snoring are restless sleep, morning headaches, morning excessive tiredness, unusual sleepiness during the day, impaired concentration and attention, output decline and snores' frequent changes. These symptoms in conjunction with indoor air pollution can lead to numerous immediate and long-term health problems, especially on respiratory and cardiovascular system. [19, 20]

VIII.DAYTIME SLEEPINESS

Because of apnea, sleep is disturbed, leading to daytime sleepiness and patients may sleep at inappropriate times. Initially drowsiness occurs only in passive activities, for example when watching TV, reading, but as the disorder progresses, it happens in more and more daily activities, hampering the professional and personal lives [7, 21] Sleepiness may occur during driving, which is a major a risk for public health, but also for the patient. Research has shown that patients with stillness who do not follow any treatment, are seven times in greater risk of causing a traffic

accident, compared to healthy people. With the start of the treatment the improvement is significant [22, 23]

IX. POOR SLEEP QUALITY

Sleep of these patients is always problematical. In most serious cases they wake up with a feeling of asphyxiation, their sleep is restless with jerks of the arms and legs or getting up number of times to urinate. It is not insignificant that gradually destroyed and the partners' quality of sleep, either because of the unbearable patients' snoring intensity or because of the intense concern as perceived the last ones' respiratory pauses [20, 24]

X. TREATMENT

As it is already known, with the age of a person, the cardiovascular system is altered and serious complications and diseases are caused leading a large number of people, especially the older ones, until death [25]

The treatment of sleep apnea, is a new factor that offers an opportunity to reduce the cardiovascular risk. For the determination of treatment shall take into account the severity of the clinical picture, the findings of the multiparametric study, the coexisting health problems (COPD, cardiovascular diseases, endocrinopathies - most typical acromegaly-) and the possible structural defects of the area [24] Conservative measures recommended to someone who suffers from mild OSA are tips for weight reduction, avoiding CNS depressants (alcohol, sleep inducing drugs), avoiding smoking, avoid heavy dinners before bedtime, occupying lateral position in sleeping [26] The most effective way of treating moderate and severe OSA is to apply a continuous positive pressure in the upper airways (CPAP). In particular, it applies to the nose a visor that provides pressurized air, preventing the concurrence of pharyngeal walls [27]

The aim of CPAP is the elimination of episodes of apnea - hypopnea and snoring in all the phases and positions of sleep. The successful implementation of this treatment has direct effects (elimination of apneas, sleepiness, snoring) and ulterior (protection of the cardiovascular, respiratory system, etc.) [11, 25]

Surgical treatment is a second-line way to tackle the OSA and has not so spectacular results in comparison with CPAP. Snoring repealed (satisfied partner!), But not and the apneas during sleep [28]

Finally it should be noted that:

- The recognition and treatment of OSA is necessary to avoid serious impacts on patients' daily life and environment. For example, a large number of accidents due to sleepiness of the driver, could be avoided if there had been an earlier diagnosis of OSA [29, 30]
- Also machine operators, drivers and other professionals should be considered for OSA, assessing the relevant symptoms that may be present, in order to prevent accidents [31]

XI. EPILOGUE

Breathing disorders during sleep the last few years are a continuously growing medical concern. The ever growing literature relating to the best and most efficient method of laboratory diagnosis of OSA led to international guidelines aimed at improving sleep, and of these patients' quality of life [32, 33] Nowadays medical science studying sleep with special sleep studies and EEG conducted during the night sleeping in a hospital with the necessary infrastructure. The decision for the treatment and the choice is based on the severity of symptoms, the results of the sleep study, the coexistence of other diseases and at the disposal of the patient.

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