

OBSTRUCTIVE SLEEP APNEA

Thesis

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M.D. Degree
In
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By

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To my wife



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INTRODUCTION

INTRODUCTION AND AIM OF WORK

Humans spend one-third of their lives sleeping so, it is not surprising that the topic of sleep has aroused the intellectual curiosity of philosopher , scientists and physicians since ancient times.

History of " Sleep Apnea Syndrome "

A systematic review of the 19th century literature related to sleep disorders revealed that patients with Obstructive sleep apnea (OSA) were vividly described in the second half of the century. Also, there were documented observations on the linkage between air way obstructions and noisy snoring, nocturnal insomnia and excessive somnolence .

The coining of the term " pickwickian " to describe an obese somnolent patient was made in 1889 during a clinical presentation of a patient with sleep apnea . Respiratory failure in sleep because of failure of the chest and diaphragmatic movements was defined as a specific sleep disorder by "Silas Weir Mitchell" in 1890 .The two main reasons for overlooking the sleep apnea syndrome for so long have been misdiagnosis of patients with the sleep apnea as having narcolepsy and skepticism regarding the validity of excessive somnolence as clinical sign .(Lavie, 1984) .

The first description of the syndrome has been attributed to Burwell et al., who in 1956 published "Extreme Obesity

Associated with hypersomnolence and Alveolar Hypoventilation :
A Pickwickian Syndrome" (Burwell et al., 1956)

Gastaut and associates , 1966 were the first investigator to show repeated apneas in sleep, in pickwickian patients . They specifically suggested that the daytime somnolence in these patients probably was caused by nocturnal sleep disturbances associated with repeated apneas. (Gastaut et al., 1966)

In 1974 "Simmons and Hill" brought the attention of otolaryngologists to an emerging syndrome of hypersomnia caused by upper airway obstruction occurring intermittently during sleep . Since that time, numerous sleep researchers have definitively demonstrated that excessive daytime sleepiness is often a result of OSA .

The recent proliferation of clinical sleep laboratories throughout the world has called considerable attention to the problem of sleep-related breathing disorders .The past 10 years have seen an explosion of interest in the OSAS. According to Bixler in 1979, OSAS affects - approximately 7 million adults in the USA (Bixler, 1979).

Manifestations of sleep apnea have been present in our society for many years. Snoring , Restless sleep and daytime drowsiness have been well recognized by the lay public, but until recently the understanding, evaluation, and treatment of these symptoms have largely eluded physicians. Snoring . is the most obvious manifestation of upper airway obstruction during sleep .

It is now, well recognized as a sign of the potentially lethal condition the "OSAS".

Since problems related to snoring and since anatomic alteration of the upper airway have been considered their primary provience, questions concerning the diagnosis and treatment of OSAS are becoming frequently encountered by otolaryngologists .

The pathogenic basis of this disorder appears to involve transient but repetitive occlusion of the upper airway during sleep . leading to recurrent episodes of asphyxia (Guilleminault . 1978) .

This inturn cause frequent arousals and sleep fragmentation. Overtime, patients may develop marked daytime sleepiness , psychologic problems systemic hypertension , pulmonary hypertension and cor-pulmonale .

Sleep apnea predispose to the occurence of various cardiac rythm disturbances, including bradycardia, tachycardia, asystole and even ventricular tachycardia, the later two may predispose to sudden death during sleep (Baker, 1980) .

Definitions :-

Before discussing SAS, some definitions should be given :-

***Apnea** : Cessation of airflow at the nostrils & the mouth for at least 10 sec .

***Hypopnea** : A fall in the in the average tidal volume by more than 50%.

- ***Apnea index (AI):** Defined as the number of apneas per hour of sleep.
- ***Respiratory disturbance index(RDI):** Defined as the total number of apneas and hypopneas per hour of sleep.
- * **Sleep apnea syndrome :** The diagnosis is made when apnea index equals or exceeds five episodes per hour or the number of apneas and hypopneas equal 30 over seven hours (Goode & Swanson, 1987).

In 1980, Richardson & his colleagues have used a percentage of total sleep time spent in apnea . They found that 1% or more is a significant amount .

Types of sleep apnea : Fig. (1)

*** Obstructive apnea :**

It is considered to occur when airflow is interrupted by an obstruction in the upper airway .

In obstructive apnea, there is no airflow despite of respiratory effort .

*** Central apnea :**

It denotes apnea due to inactive respiratory muscle . Demonstration of central apnea requires a sensitive system that will detect small inspiratory efforts; for example, oesophageal manometry for monitoring intrathoracic pressure.

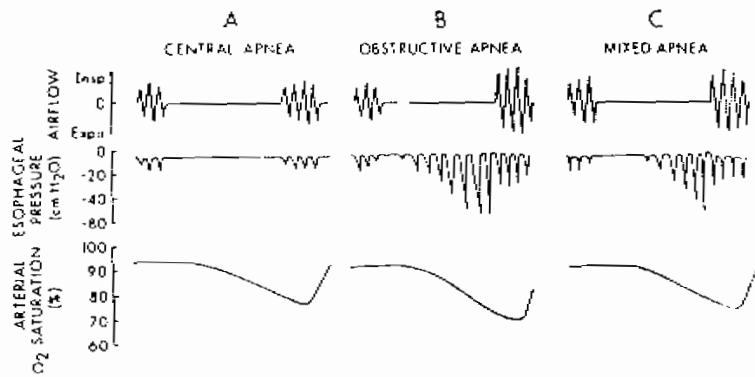


Fig. (1) Representation of apneas: patterns of airflow, respiratory effort (esophageal pressure), and arterial oxygen saturation in central, obstructive and mixed apneas. Central apnea is diagnosed by absence of airflow and lack of respiratory effort. Obstructive apnea is characterized by absence of airflow and presence of continued respiratory effort. Mixed apnea is present when there is absence of airflow associated with lack of respiratory effort initially, followed by respiratory effort usually at end of apneic episode.

Quoted from : Thawley et al, (1989).

*** Mixed apnea :**

It typically shows a period of central apnea followed immediately by obstructive apnea with progressively increasing respiratory efforts until the obstruction. is relieved.

Commonly patient have both central & obstructive apneas, each occurring separately at different times . The relief of both central and obstructive components by tracheostomy argues that central components depends on the obstructive component, which inturn suggests that central apneas are of reflex origin . Obstructive & mixed apneas are much more common than pure central apnea. Patients are often apneic for 50% of their total sleep. (Ingbar & Gree, 1985) .

Now, it is becoming more common for the otolaryngologist's office to be the entry point into the medical system for patients with SAS, thus the practicing otolaryngologist has been thrust into the fore-front in the diagnosis & management of SAS .

AIM OF WORK

The aim of this work is to throw the light on the disease and its symptoms and signs and latest advances in diagnosis, using sleep laboratory, (which is now available in our hospitals in Ain Shams University), to put a clear base line for surgical selection of patients and also to evaluate the different techniques of surgical intervention of OSAS , its benefits and complications .