

SLEEP APNEA — AN OVERVIEW

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ABSTRACT

Though distressing and potentially dangerous, sleep apnea may be an under-recognized disease in many countries. The obstructive type, which usually presents with loud snoring and excessive daytime sleepiness, is by far the commonest form. It causes a great deal of medical, social and psychological morbidity as well as an increased mortality. Doctors of different specialties have an important role in detecting and referring suspected patients for early assessment and treatment. Multidisciplinary management in a general hospital and accurate assessment with polysomnography are essential as modern and sometimes effective methods of treatment are becoming available.

Keywords: Sleep apnea, obstructive type, polysomnography, treatment

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INTRODUCTION

As with the situation in western countries several years ago (1, 2), sleep apnea may be under-recognized in many Asian countries. Although vivid descriptions of it can be found well before the nineteenth century (3, 4), most sleep research on the condition has taken place only in the past two decades (5). Sleep apnea causes a great deal of medical, social and psychological morbidity as well as an increased mortality (6). As modern and sometimes effective methods are becoming available, it is important for doctors of various specialties to be familiar with the condition so that patients are properly assessed and treated.

DEFINITION

Sleep apnea refers to the periodic cessation of breathing during sleep. As this can occur in normal subjects especially during the REM (rapid eye movement) phase of sleep and under the influence of alcohol (7) or hypnotics (8), pathological sleep apnea has been operationally defined as the cessation of breathing lasting ten seconds or more that occurs thirty or more times during a seven-hour period of sleep. Patients with clinically obvious sleep apnea frequently have several hundreds of apneic episodes during a single night of sleep.

CLASSIFICATION

Sleep apnea can be central, obstructive or mixed. In the central type, there is no thoracic or abdominal respiratory effort during the apneic spell, while in the obstructive form respiratory efforts persist but are made ineffective by upper airway blockade. Mixed apnea starts with the

absence of respiratory effort followed by upper airway obstruction. These three forms of apnea often co-exist in the same patient so that classification depends on the predominant type found in a sleep recording. Obstructive apnea is by far the commonest seen in clinical practice.

In the ASDC (Association of Sleep Disorders Center) system (9, 10), sleep apnea is classified under both DIMS (Disorders of Initiating and Maintaining Sleep) and DOES (Disorders of Excessive Somnolence). This means that sleep apnea can present as insomnia (especially for the rarer central type) as well as excessive sleepiness which is much more usual.

PREVALENCE

Prevalence figures are at the moment unknown for most Asian countries including Hong Kong, but we feel that it is not uncommon and is under-recognized. A lower limit of at least 0.89% has been suggested to be the true prevalence in the adult male healthy working population in Israel (11). This represents an enormous number of afflicted individuals if the whole male population older than twenty-one is taken into account. In countries where sleep disorders clinics is established, an increasing number of patients with sleep apnea are being detected and treated (2, 12, 13).

CLINICAL PRESENTATION

Obstructive sleep apnea and central sleep apnea present differently. Daytime hypersomnolence and loud snoring are two commonest symptoms in obstructive apnea. Patients sleep easily in the day time and frequently in inappropriate circumstances, e.g. while watching movies, during a meeting or even standing in a bus. Compared with the snoring of normal subjects without sleep apnea, the snoring of sleep apneic patients are characteristically loud, constant in intensity and interrupted by respiratory pause and very loud snorting and gasping. This has been named "resuscitative snoring" and is best confirmed with the sleeping partner. It must be appreciated that sleep apneic patients with loud snoring are not "deep sleepers"; indeed, they are frequently deprived of "Deep Sleep" or "Slow Wave Sleep" (SWS) and have fragmented sleep architecture (14).

Other common features include excessive motor activity during sleep, obesity, morning headache, intellectual deterioration, confusional episodes and impotence (14). In contrast, the much less common central form of apnea can present as insomnia with awakenings

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and cessation of breathing during sleep; hypersomnolence is uncommon; snoring is mild and intermittent; and obesity is rare. The prescription of hypnotics with central depressant effects for these insomniac subjects represents a special hazard. Sleep apnea can lead to many dangerous cardiovascular and respiratory complications that can be worked out from physiological principles (15). These include hypoxia, hypercapnia, pulmonary hypertension, right heart failure, cardiac arrhythmias, secondary or "unexplained" polycythemia, respiratory failure and sudden death. The need for treatment is clear.

DIFFERENTIAL DIAGNOSIS

Daytime sleepiness or tiredness has been viewed with skepticism as a valid clinical sign (3) and is not a very specific symptom, so that other factors must be considered especially when the doctor is faced with the milder forms of the disorder. Sleep deprivation, time of day (biorhythms), diet, low environmental stimulation and motivation are but some of the factors. Sleep disorders such as narcolepsy, psychiatric disorders such as depression and various medical disorders such as hypothyroidism (16, 17) and acromegaly (14, 18) must also be borne in mind. Clinical features of sleep apnea other than daytime sleepiness are obviously important clues.

ETIOLOGY

While the most significant factor in the development of obstructive sleep apnea is upper airway collapse during sleep, there is a great deal of speculation about the exact pathogenesis of the disorder, and much remains to be learnt about its pathophysiology. The cause of central sleep apnea is especially obscure. Risk factors include obesity, systemic hypertension (19) and alcohol use (20). In a small proportion of patients obvious causes for airway obstruction are found, such as mandibular deformity, micrognathia, adeno-tonsillar hypertrophy, nasal septum deviation, large tongue (as in acromegaly) and vocal cord paralysis. Recent data suggest that sleep apneic patients have an anatomically smaller oropharynx (21). These must be looked for as part of clinical screening.

EVALUATION

This follows the lines of history-taking, physical examination, preliminary tests and confirmatory investigations. History-taking involves defining the symptoms clearly, identifying risk factors, interviewing the sleeping partner and assessing the degree of disability suffered by the patient. A heightened index of suspicion is of paramount importance. For example, some degree of daytime sleepiness and loud snoring in a patient being treated for a primary problem of raised blood pressure could easily be neglected or discarded as 'not abnormal'. Physical examination should include looking for obvious airway obstruction, checking the blood pressure and assessing the cardio-respiratory status. At this stage a provisional diagnosis of obstructive sleep apnea can often be made, especially in the more severe cases.

The final diagnosis and assessment of sleep apnea are best done by polysomnography in a sleep laboratory (22). Patients who complain of only loud snoring without suffering from excessive daytime sleepiness have nonetheless been shown to have more than 200 to 300 episodes of apnea in a single night (22). The simultaneous recording of electroencephalograph, electromyogram, heart rate, oronasal airflow, chest and abdominal breathing movements and oxygen hemoglobin saturation (using ear or finger oximetry) would confirm the presence,

determine the type and severity of the sleep apnea. The degree of oxygen desaturation and presence of dangerous arrhythmias are important indices of severity apart from the actual number and length of apneic episodes on the polysomnographic record. An otorhinolaryngological examination is essential to detect the presence of any treatable airway obstruction.

Psychosocial Aspects

These patients suffer from varying degrees of cognitive impairment (as shown by slowness of thinking, diminished attention span and memory impairment), and much psychological distress with significant disruption of psychosocial functioning in the areas of education, work, interpersonal relations and marriage (6). Psychometric assessment using the MMPI (Minnesota Multiphasic Personality Inventory) pointed to a reactive somatic-neurotic pattern of psychopathology (6). Recently it has been shown that the wives of sleep apneic patients also suffer from poor adjustment in marital and social areas (24). These should be taken into account in the management plan.

TREATMENT

Sleep apnea is usually amenable to ameliorative and sometimes curative treatment. It requires multidisciplinary management preferably within a general hospital (13, 23). Treatment can be pharmacological or non-pharmacological.

Pharmacological agents that have been used include protriptyline, a stimulating tricyclic antidepressant, medroxyprogesterone and acetazolamide (6). They may be used in mild forms of obstructive sleep apnea and in central sleep apnea, but their effectiveness and long-term benefit are uncertain. However, the correction of metabolic conditions such as thyroxine replacement in myxedematous patients can lead to impressive reduction of symptomatology and apnea frequency even before any change in body weight (16, 17).

Non-pharmacological treatment is usually the more important form. It includes weight reduction (frequently difficult), correction of airway obstruction such as by nasal septoplasty, tonsillectomy, nasal continuous positive airway pressure, tracheostomy and uvulopalatopharyngoplasty (UPPP) (25). These different methods have their own advantages and disadvantages so that the severity and type of apnea, the level of daytime functioning and patient compliance factors must all be considered before deciding on the modality of treatment to be recommended in a particular patient. Corrective procedures such as tonsillectomy can lead to very dramatic clinical and laboratory improvement (26). UPPP which removes redundant oropharyngeal tissue is reported in short-term follow-up studies to be helpful in about 50% of patients (27, 28). Tracheostomy is associated with operative, aesthetic and psychological complications and is now generally reserved for those with marked impairment. Nasal continuous positive airway pressure may be uncomfortable but is non-surgical and effective. The disadvantages of all these treatments must be balanced against the possible complications of the untreated sleep apnea syndrome. Indeed, complications such as pulmonary hypertension and heart failure would require medical treatment in their own right. Health education and counseling to alleviate any psychological, marital and social difficulties especially in patients requiring tracheostomy should form part of a comprehensive treatment plan.



The sleep apneic patient and the 'silent' partner.

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