Obstructive Sleep Apnea: Do Size and Site Matter?

Nitipatana Chierakul, M.D.

Department of Medicine, and Siriraj Sleep Center, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok 10700, Thailand.

Siriraj Med J 2006;58: 676-677
E-journal: http://www.sirirajmedj.com

Obstructive sleep apnea/hypopnea syndrome (OSAHS) can be defined as a coexistence of excessive daytime sleepiness with irregular breathing at night. At present, there is a large and increasing demand for sleep service facilities due to the high prevalence and growing public awareness of sleep disorders. The consequences of untreated OSAHS include: increased daytime sleepiness, impairment of cognitive function, and also mood and personality changes. Well recognized predisposing factors to this syndrome are obesity, male gender, and increasing age.

Site of obstruction and site of obesity

Structural narrowing of the upper airway is a major factor contributing to pharyngeal occlusion during sleep in OSAHS. A spectrum of craniofacial soft tissue and skeletal abnormalities has been demonstrated in patients with OSAHS. The relative contributions of soft tissue and skeletal abnormalities vary among patients and between ethnic groups. In one study, Asians have more pronounced skeletal abnormalities and are less obese than white subjects for a given degree of severity of OSAHS.[1]

Sleep laboratory has been established in Department of Medicine, Faculty of Medicine Siriraj Hospital since 1994. The new Siriraj Sleep Center with multidisciplinary organization will be established in the near future to accommodate the growing demand. During July 2003 - September 2005, there were 142 OSAHS patients evaluated for treatment with continuous positive airway pressure (CPAP). Anthropometric measurements of these patients are presented in Table 1.

From our preliminary data, those who are at risk for OSAHS in our country should have:

BMI	> 29 kg/m^2
Neck circumference	> 40 cm
Waist circumference	> 100 cm
Hip circumference	> 105 cm
and Waist/Hip ratio	> 0.95

Those who have reached or nearly reached these figures please be informed that "a silent killer is coming to you".

TABLE 1. Anthropometric data of Siriraj OSAHS patients

Parameter	Value
AHI (events/hr)	48 (5 -130)
BMI (kg/m^2)	29.2 (19.1-50.3)
Neck circumference (cm)	40.2 (30-52)
Waist circumference (cm)	100.1 (70-145)
Hip circumference (cm)	105.5 (74-151)
Waist/Hip ratio	0.95

NB: data were presented in mean (range)

Size of OSA Severity

The essential determination of appropriate treatment for OSA is the severity of illness. In general, factors in assessing OSA severity include:[2]

1. Severe daytime sleepiness/requirement of alertness

Valuable data should be derived from spouses or family members.

2. Amount of supine sleep and REM sleep in the diagnostic study

The usual severity of illness may be underestimated if some factors may have prevented the events in a night of sleep recording (e.g., minimal supine sleep, lack of REM sleep). This usually happens in the split-night polysomnography.[3]

3. Anpea/Hypopnea index (AHI)

According to the clinical practice parameters of the American Academy of Sleep Medicine, OSA patients should be treated if they have:[4]

3.1 Respiratory disturbance index (or simply an AHI) > 30 events/hr regardless of symptoms;

3.2 An RDI > 5 events/hr with excessive daytime sleepiness or poor performance or others symptoms;

3.3 An RDI > 5 events/hr with established cardiovascular diseases or multiple risk factors;

4. Respiratory arousal index > 10 events/hr

This amount of sleep fragmentation may correlate better with daytime symptoms than the AHI.

5. Severe arterial oxygen desaturation

This can be assessing by many parameters such as:

5.1 Desaturation index (number of desaturation > 10 sec in 1 hour),

5.2 Minimum saturation,

5.3 Time spent with saturation under 90%.

6. Co-morbid illness, especially ischemic heart disease or cerebrovascular disease

7. Sleep-associated arrhythmias

By thorough gathering these informations, sleep physicians can decide treatment options stratified by OSA severity into this following scheme.[2, 5, 6]

General Treatment Guidelines		
UARS/Mild OSA	**Moderate OSA**	**Severe OSA**
Weight loss	Positive airway pressure	Positive airway pressure
Position therapy	Oral appliances	Tracheostomy
Treat nasal congestion	UPPP, GAHM	GAHM, MMO
Oral appliances	Weight loss-adjunctive	Oral appliances
UPPP for OSA, UARS	Position therapy-adjunctive	Weight loss-adjunctive
LAUP for snoring (UARS?)		
Positive airway pressure		

UARS = upper airway resistance syndrome, UPPP = uvulopalatopharyngoplasty, LAU = laser-assisted uvulopalatoplasty, GAHM = genioglossus advancement hyoid myotomy, MMO = mandibulo-maxillary osteotomy, positive airway pressure = CPAP or bilevel pressure

REFERENCES

1. Li KK, Kushida C, Powell NB, Riley RW, Guilleminault C. Obstructive sleep apnea syndrome: a comparison between Far-East Asian and white men. Laryngoscope 2000;110:1689-93.
2. Treatment of obstructive sleep apnea. In: Berry RB, ed. Sleep medicine pearls, 2nd ed. Philadelphia:Hanley & Belfus, 2003:119-20.
3. ASDA Standards of Practice Committee. Practice parameters for the indications for polysmnography and related procedures. Sleep 1997; 20:406-22.
4. Loube DI, Gay PC, Strohl KP, et al. Indications for positive airway pressure treatment of adult obstructive sleep apnea patients. A consensus statement. Chest 1999;115:863-6.
5. ASDA Standards of Practice Committee. Practice parameters for the treatment of snoring and obstructive sleep apnea with oral appliances. Sleep 1995;18:511-3.
6. Practice parameters for the treatment of obstructive sleep apnea in adults: The efficacy of surgical modifications of the upper airway. Report of the American Sleep Disorders Association. Sleep 1996;19:152-5.