

Sleep Medicine

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DEFINITION OF OBSTRUCTIVE SLEEP APNOEA

It is worthwhile reviewing what is meant for sleep apnoea given the high level of confusion that stems from a variety of research versus clinical definitions.

The initial definition of obstructive sleep apnoea was of at least 30 or more stopping breathing per hour over a period of 7 hours sleep (Guilleminault 1978). That is less than 5 stopping breathing per hour. This was based on a study of 20 normal subjects below the age of 60. Initially the definition included *only* apnoea (stopping breathing completely) which is a fairly robust measurement. Over the years the hypopneas were included which is much more difficult to define and a measurement which involves a high degree of subjective judgment. At that time the definition of obstructive sleep apnoea was of 15 or more apnoea/hypopnea per hour (the apnoea/hypopnea index – AHI). To complicate things further another parameter called *respiratory event related arousals* (RERA) was also included on the definition. The combination of apnoea plus hypopnea plus RERA is often referred to RDI (respiratory disturbance index). However, to add further to the confusion the RDI index has also been used to describe disturbed breathing in single channel flow measurements screening test.

I have enclosed below a table published in 2008 by Pavlova who studied 163 healthy individuals (106 men) with good sleep quality, no medications and no medical problems in different age groups. The table outlines the RDI and OAI (obstructive apnoea index). You can easily see that in the group above the age of 65 an RDI of 22 events per hour can be within the normal limits in someone who is healthy and symptom-free.

Table 1—Characteristics of all Subjects When Classified by Age Group

	Age range, y				P Value
	< 35 (n = 63)	35-49 (n = 15)	50-65 (n = 42)	> 65 (n = 43)	
Age, y	25.1 (4.2)	40.2 (2.9)	58.0 (4.6)	71.1 (4.1)	
Sex, no, M/F	39/24	12/3	22/20	33/10	
BMI, kg/m ²	23.4 (2.7)	25.8 (2.4)	24.8 (3.1)	24.8 (2.3)	0.034
ESS, score	4.0 (2.8)	2.8 (1.7)	3.5 (2.9)	4.5 (2.7)	NS
RDI, no./h	4.3 (4.2)	7.7 (4.1)	12.8 (12.4)	22.0 (17.4)	< 0.00001
PLMI, no./h	1.3 (3.1)	1.6 (3.6)	7.4 (15.5)	20.2 (32.3)	< 0.00001
Sleep efficiency, %	83.2 (11.6)	86.5 (8.1)	74.5 (10.8)	70.6 (17.3)	0.0005
Arousal index, no./h	16.4 (7.4)	23.3 (7.0)	22.0 (9.6)	26.6 (12.9)	< 0.00001
OAI, no./h	0.2 (1.1)	0.1 (0.3)	1.3 (2.4)	5.4 (9.1)	< 0.00001
Minimum SaO ₂ , %	91.6 (3.9)	90.5 (5.0)	89.1 (5.7)	84.9 (6.9)	< 0.00001
Reporting snoring*					
At home	17	15	30	35	
In lab	27	54	49	40	
Awake SaO ₂ < 95% ^a	3	0	10	26	
Minimum SaO ₂ < 90% ^a	19	31	46	74	

Data are presented as mean ± SD, except sex, which is provided as the number of men and women and those categories marked with *, which are presented as percentage. BMI refers to body mass index; ESS, Epworth Sleepiness Scale; RDI, respiratory disturbance index (the number of events per hour of sleep); PLMI; periodic limb movement index (the number of events per hour of sleep); OAI, obstructive apnea index (the number of obstructive apneas per hour of sleep).

Practical Implications

1. ***Obstructive sleep apnoea syndrome*** remains a clinical diagnosis. In the absence of symptoms, merely finding disturbed breathing may not be clinically significant in particular if there is no oxygen desaturation.
2. In population aged 65 years or above, disturbed breathing up to 20 events per hour is often within the normal limits in the absence of symptoms.
3. In a younger population the degree of tiredness may or may not be due to disturbed breathing if the apnoea/hypopnea is low. Often other factors should be considered including social and lifestyle issues.
4. The interpretation of the apnoea/hypopnea often depends on the criteria used.

Guilleminault et al *Clinical overview of sleep apnea syndrome* Kroc Foundation Series vol. 11 1978

Pavlova et al *Polysomnographic Respiratory Abnormalities in Asymptomatic Individuals* Sleep 2008