

# Is obstructive sleep apnea more common in adults with arrhythmias?

Sir,

Obstructive sleep apnea (OSA), which is defined as a repetitive upper airway collapse that occurs during sleep, producing an interruption of ventilation, has a deleterious effect on the cardiovascular system.<sup>[1,2]</sup> Recent studies evaluating the prevalence of arrhythmias in patients with OSA have shown that there is a close, maybe causal, link between the presence of OSA and arrhythmias.<sup>[3,4]</sup> However, there has been no evaluation of the prevalence of OSA in patients presenting primarily with arrhythmias, till date.

We, therefore, conducted this study to estimate the prevalence of OSA in an Indian population group of patients with arrhythmias. The aim of this study was to study the prevalence of daytime sleepiness (Epworth sleepiness scale [ESS])<sup>[5]</sup> and OSA (Berlin questionnaire [BQ])<sup>[6,7]</sup> in a population of patients known to be suffering from arrhythmias, in a tertiary arrhythmia clinic. Patients having mitral/tricuspid valvular heart disease, congenital heart disease, and central nervous system disorders and with age <18 years and employed in occupations involving night-shift work were excluded from this study.

A total of 162 patients (94 (58%) males and 68 (42%) females) with arrhythmias were included in the study. The proportion (23.5%) of patients was highest in the age group of 50–59 years [Table 1]. The types of arrhythmia in the patients in the study as per location and heart rate are given in Table 2.

The patient score responses on the ESS showed a significant proportion of patients with increased propensity for sleepiness (21.6%). The age-wise stratification showed that the age group of 50–59 years had the highest percentage of patients with increased propensity for sleepiness by the ESS (28.94%). Patients with tachyarrhythmias (23.33%) showed a higher percentage of patients with ESS score  $\geq 10$  as compared to patients with bradyarrhythmias (10.52%) [Table 3].

The patient score responses on the BQ also showed a significant proportion of patients with increased risk for OSA (37.03%). By the BQ, the highest risk for OSA was observed in the 70–79 years age subgroup (71.42%). The number of patients with tachyarrhythmias (37.5%) and bradyarrhythmias (36.84%) with a BQ score  $\geq 2$  were comparable [Table 4].

In the recent years, the association between OSA and arrhythmias has been of increasing interest since cyclic

**Table 1: Baseline characteristics of patients in the study**

	Number (%) of patients
Age distribution of patients in the study	
Range (years)	
<30	15 (9.25)
30-39	12 (7.40)
40-49	29 (17.90)
50-59	38 (23.45)
60-69	32 (19.75)
70-79	28 (17.28)
$\geq 80$	8 (4.93)
Category (BMI range (kg/m <sup>2</sup> ))	
Severely underweight (<16.0)	2 (1.23)
Underweight (16.0-18.5)	3 (1.85)
Normal (18.5-25)	82 (50.61)
Overweight (25-30)	46 (28.39)
Obese Class I (30-35)	23 (14.19)
Obese Class II (35-40)	5 (3.08)
Obese Class III (over 40)	1 (0.61)
Comorbidities	
Diabetes	25 (15.43)
Hypertension	77 (47.53)
CAD	28 (17.28)
Asthma	18 (11.11)
COPD	3 (1.85)
None	11 (6.79)

BMI: Body mass index, CAD: Coronary artery disease, COPD: Chronic obstructive pulmonary disease

**Table 2: Percentage of arrhythmia types in the study**

Heart rate type	By heart rate	
	Number (%) of patients	
Tachycardia	121 (74.7)	
Bradycardia	19 (11.7)	
Normal rate	16 (9.9)	
Variable (tachy-brady syndrome)	6 (3.7)	

variation in heart rate is considered typical in sleep disorders. Cardiac arrhythmias are presumed to be a common problem in patients with OSA although the true prevalence and clinical relevance of cardiac arrhythmias remain unknown. Previous studies in patients with OSA had documented that 48% of patients had cardiac arrhythmias with bradyarrhythmias in 18%, sustained ventricular tachycardia in 2%, sinus arrest in 11%, second-degree atrioventricular block in 8%, and frequent premature ventricular contractions in 19%.

In our evaluation of the prevalence of OSA in patients with arrhythmias, we found that the prevalence of OSA, as established by BQ, was as high as 37%. In comparison from the epidemiological data available, OSA affects only 2–4% of total population. This striking difference affirms

**Table 3: Patient scores on the Epworth sleepiness scale**

ESS	No. (%)
Score 0-9	127 (78.39)
Score $\geq 10$	35 (21.6)
<b>In patients with ESS score <math>\geq 10</math> (%)</b>	
Age (years) subgroups	
<30 (n=15)	1 (6.66)
30-39 (n=12)	3 (25)
40-49 (n=29)	6 (20.68)
50-59 (n=38)	11 (28.94)
60-69 (n=32)	6 (18.75)
70-79 (n=28)	6 (21.42)
$\geq 80$ (n=8)	2 (25)
Gender	
Males (n=94)	18 (19.14)
Females (n=68)	17 (25)
Arrhythmia types	
Tachyarrhythmias (n=121)	28 (23.33)
Bradyarrhythmias (n=19)	2 (10.52)
Normal rate (n=16)	1 (6.25)
Others (n=6)	4 (57.14)

ESS: Epworth sleepiness scale

**Table 4: Patient scores on the Berlin questionnaire**

BQ score	No. (%)
Low risk	35 (21.6)
0	67 (41.35)
1	
High risk	51 (31.48)
2	9 (5.55)
3	
<b>In patients with BQ score <math>\geq 2</math> (%)</b>	
Age (years) subgroups	
<30 (n=15)	0
30-39 (n=12)	3 (25)
40-49 (n=29)	5 (17.24)
50-59 (n=38)	16 (42.10)
60-69 (n=32)	13 (40.62)
70-79 (n=28)	20 (71.42)
$\geq 80$ (n=8)	3 (37.5)
Gender	
Males (n=94)	34 (36.17)
Females (n=68)	25 (36.76)
Arrhythmia types	
Tachyarrhythmias (n=120)	45 (37.5)
Bradyarrhythmias (n=19)	7 (36.84)
Normal rate (n=16)	4 (25)
Others (n=7) (SND – 6, slow - fast AVNRT 1)	4 (57.14)

BQ: Berlin questionnaire, AVNRT: Atrioventricular nodal reentry tachycardia, SND: Sinus node disease

the strong association of OSA and arrhythmias. In our study, the prevalence in male and female patients was comparable although the prevalence of OSA in men has been observed to be almost twice that of women in the previous studies.

The findings from this study emphasize the association between OSA and cardiac arrhythmias. It establishes a rationale for systematic arrhythmia detection and reporting in patients with OSA. The various challenges that need to be addressed include widespread comorbidities including obesity that obscure clearer understanding of any

independent cardiovascular consequence of sleep apnea *per se*. We also need to have interventional studies addressing whether the treatment of sleep apnea confers any tangible benefit in terms of arrhythmias and vice versa.

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### Conflicts of interest

There are no conflicts of interest.

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