



ORIGINAL ARTICLE

Use of the Stop-bang questionnaire for the population determination of obstructive sleep apnea in surgical patients



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Abstract

Objective: Determine if patients undergoing elective surgery have risk factors for obstructive sleep apnea syndrome (OSAS), using the Stop-bang questionnaire.

Material and methods: Patients who entered a university hospital for surgery and met the inclusion criteria were asked to be weighed, measure, and answered questions about their sleep habit. They were measured and weighed on a stationary SECA scale with a maximum capacity of 220 kg. The neck was measured in inches with a tape measure. The questionnaire was answered and given a risk measured by the same scale, and the data was collected in the capture sheet.

Results: A power of 80% was used, considering a *p*-value that registered below 0.05 statistically significant. Data was collected from 222 patients undergoing surgical procedures at a teaching hospital in northeastern México. The average age was 57 years (24–87 years). The body mass index presented an average of 29.6 kg/m². We found that 19.8% of the patients had normal BMI, with 80.2% of the sample being overweight or obese (*n* = 178). As for the circumference of the neck, an average of 16.4 in. was recorded.

Conclusions: It was found that 68% of the sample posed an intermediate or high risk for OSAS, compared to other literature that marked 30%. Also, 80% of the preoperative population was found to be overweight or obese.

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Introduction

Obstructive sleep apnea (OSA) is a common chronic disorder which often requires attention and care all throughout life. Characteristics in adults include obstructive apneas, hypopnea, or respiratory distress, and daytime symptoms attributed to interrupted sleep. OSA is an important disorder because patients have a higher risk of deficient neurocognitive performance, as well as problems in other systems. Untreated severe OSA has been linked to a higher cardiovascular mortality.¹ The most important risk factors of OSAS are advanced age, male, obesity, and high blood pressure. Of these, obesity is without a doubt the most significant risk; prevalence increases progressively as body mass index increases (BMI).² Between the years 1990 and 2010, OSAS prevalence increased for each group age and BMI category, up to 50%.³

This syndrome is characterized by a recurrent functional collapse of the airways during sleep, causing a substantial reduction and, in some cases, a total ceasing of airflow, regardless of any breathing efforts in progress. This leads to periodic perturbations in the exchange of air.⁴ The collapse or opening of the pharynx during sleep depends on two opposite forces: one is the "dilating" force which tends to keep the pharynx opened through the genioglossi muscles and pulmonary volume. The other is the "collapsing" force which tends to close the pharynx. These include negative intraluminal pressure and the positive extramural pressure which the soft tissues apply.⁴

Polysomnography is multiple parameters test utilized in the study of sleep. Today, it is the gold standard for the diagnosis of sleep disorders, particularly of obstructive sleep apnea. In fact, most studies nowadays involving polysomnography are for the diagnosis of OSAS.⁵ Among the detection tools used in OSAS screening are the Stop-bang questionnaire, The Berlin questionnaire and the Sleep Apnea Clinical Score (SACS), to name a few.

The Stop-bang questionnaire requires "yes" or "no" answers to eight questions about snoring, tiredness, observed apneas and blood pressure, BMI >35 kg/m², age >50 years, and neck circumference >17 in. for males and 16 in. for females. Even though the Stop-bang questionnaire grants the same score for any question, not all items have the same predictive value for OSAS, and a two-step scoring system may improve performance.⁵

The potential benefits of successful OSAS treatment include an improvement in the patient's quality of life, improvement in systemic blood pressure, reduction of the use and costs of health attention, and possibly a reduction in cardiovascular morbidity and mortality.⁶

Materials and methods

With the previous authorization of the Ethics Committee, a total of 222 patients were studied. Taking into account the following selection criteria; all the patients who were admitted to the pre-surgical area of the university hospital fully conscious and oriented, and who understood the items in the questionnaire. Also being between 40 and 75 years of age, male or female, with AAS I, II or III, regardless of their type of anesthesia. The patients who met all requirements

and criteria were asked permission to have their measurements taken and were asked about their sleeping habits. The patients were weighed and measured using a SECA stationary scale with a maximum capacity of 220 kg; their necks were measured in inches using a measuring tape. After the questionnaire was conducted, they were given a risk measured by the same scale, and the data was gathered in a form.

Exclusion criteria included disoriented patients, patients with neurological deterioration who did not understand or could not answer the questionnaire, anyone outside of the age range, SAA IV, and patients who were incapable of walking to be weighed.

Results

Data were collected from 222 patients, of whom 104 were men and 118 were women, as well as by surgical specialty, General Surgery with 71 patients (32%), Traumatology with 26 patients (12%), Urology with 51 patients (23%), Gynecology with 33 patients (15%), Otolaryngology with 13 patients (6%), Plastic Surgery with 11 patients (5%), Neurosurgery with 12 patients (5%), Ophthalmology with 5 patients (2%).

General demographics

The median age of all the patients was 57 years (24–87 years). The body mass index showed an average of 29.6 kg/m². Regarding the circumference of the neck, an average of 16.4 inches (12.5–21.5) was recorded. The average value of the neck diameter for women in inches was 15.61 inches (± 1.33), and in men it was 17.22 (± 1.59) $p < 0.001$. 19.8% of the sample had a BMI considered normal, with 80.2% of the sample being overweight or obese ($n = 178$).

The most relevant results are presented in [Tables 1–3](#).

Demographic data

OSAS risk factors

In this study, 62.2% of patients admitted snoring loudly, 39.6% felt tired during the daytime, and 36% were receiving treatment for high blood pressure ([Table 3](#)).

About 22% of all patients had four risk factors for OSAS, 20.7% had three, and 19.4% had two of them; 8.7% of patients had six or more risk factors ([Table 4](#)).

Risk stratification

Of all the patients included in the sample, 68% of them were considered at intermediate to high risk ($n = 151$). Of the 47.7% of patients having a high OSAS risk level, 53% of them had either overweight or obesity ([Table 5](#)). Most relevant demographic and clinical variables according to OSAS risk group are shown in [Table 1](#).

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