RESEARCH ARTICLE

OXYGENDESATURATION INDEX ASSOCIATED TO HIGH STOP-BANG QUESTIONNAIRE, APPLIED IN PREANAESTHETIC CONSULTATION

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ABSTRACT

Introduction: The STOP-Bang questionnaire has been useful to identify patients with high risk of oxygen desaturation, among others postoperative complications. **Objective:** Determine the association of oxygen desaturation with the high STOP-Bang questionnaire applied in preanaesthetic consultation. **Materials and methods:** Observational, prospective, longitudinaldesign. It was performed in the Navy Medical Center. The study included patients over 18 years old divided into two groups under general anesthesia: the STOP-Bang score < 3 and ≥3. The patients were assessed with the STOP-Bang questionnaire, sensitivity for moderate 93%. Analyzed through descriptive statistic-study and Xi^2 significance $p<0.05$. And statistic package SPSSv24.0. **Results:** A sample of 121 patients were programmed for surgery under general anesthesia, The STOP-Bang scores high 85 and low 36. Patients over 50 years old in 49 (58%) high STOP-Bang score; atrial fibrillation 17 (17.6%) high STOP-Bang and 0% low STOP-Bang scores. Hypertensive patients of 52 (61%) high STOP-Bang and 5 (14%) low scores, $p<0.000$. Oxygen desaturation in 18 (21%) STOP-Bang high and, 1 (3%) low scores, $p<0.012$ OR 9.4 (IC 95% 1.2-73.3). **Conclusions:** Higher scores of STOP-Bang were associated to oxygen desaturation and cardiovascular disease risk.

INTRODUCTION

The obstructive sleep apnea and hypopnea syndrome (SAHOS) is characterized by the occurrence of recurrent events of airflow limitation during sleep, generated by anatomical-functional alterations of the upper airway, causing decreases in the saturation of oxyhemoglobin and micro awakenings (Kapur et al., 2017; Acar, 2014). The gold standard for diagnosing SAHOS is polysomnography, which measures the apnea-hypopnea index (IHA) with different cut-off points: IAH ≥5, SAHOS is mild; if the IAH ≥15, the SAHOS is moderate and hygienic-dietary measures and monitoring are required in sleep units respectively, as well as in severe SAHOS (IAH ≥30) (Bibbins-Domingo et al., 2017). It has a prevalence of 2% for women and 4% for men in the general population, this prevalence increases with age, tripling in the elderly compared to the middle ages. Also, the male / female ratio is in the middle ages of 2-3 / 1, tending to equalize from menopause (Xará, 2015). Other variables that influence the appearance of this syndrome or its aggravation are alcohol, tobacco, sedative, hypnotic and barbiturate use and supine position (Díaz-Cambriles, 2013).

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SAHOS warns of the vulnerability to airway obstruction, beyond the high perioperative supervision, with the increase of postoperative asphyxiation (Hillman, 2017). Regarding the surgical risk, patients with SAHOS who are operated by general anesthesia have a higher risk of perioperative complications (Soares, 2011). This implies a challenge for the anesthesiologist, due to the increase in morbidity and mortality in the transoperative period and the high association of SAHOS with the difficult airway. The SAHOS associated with arterial hypertension is responsible for approximately 50% of myocardial infarctions within the operating room (Oliva Ramos, 2016). Thus, patients with SAHOS may suffer from postoperative cardiovascular, neurological and respiratory diseases; Because SAHOS participates in the oxygen desaturation, to measure this, the pulse oximeter is available, which allows to measure the oxygen saturation (SO2) of the hemoglobin constantly and non-invasively (Diwakar, 2016; Moller, 1997). On the other hand, studies in humans and animals have shown effects of anesthetics in the upper airway by a wide variety of mechanisms. Some of them, is that anesthetics decrease muscle work and neuronal activity that is important for breathing, as well as wakefulness (Eikermann et al., 2008). The most widely used scale for SAHOS screening is the STOP-Bang questionnaire and consists of four dichotomous questions (yes / no) on snoring, fatigue, observed apneas and systemic arterial hypertension (STOP

questionnaire) and four dichotomous questions (yes / no) relative to anthropometric parameters, which are Body mass index> 35 kg / m2, age over 50 years, neck circumference greater than 40 cm and male sex (Bang questionnaire); with scores ranging from 0 to 8, whose score $\geq$ 3 has shown a high sensitivity to detect OSAHS in 93% and 100% for moderate and severe (Terán et al., 2000; Chung, 2008). So the purpose of this study is to identify the oxygen saturation measured with a pulse oximeter in the postoperative period, and define the association of the high STOP-Bang questionnaire with oxygen desaturation.

MATERIAL AND METHODS

An observational, prospective, longitudinal and analytical study was performed; at the Naval Medical Center, by reviewing the clinical file, including 121 patients scheduled for general anesthesia, over 18 years of age from January 1 to March 31, 2019; patients who did not have in the file the information required for the study, under local or regional anesthesia or sedation, pregnant women, with psychiatric or neurological disorders and emergency surgeries were excluded, the STOP-Bang questionnaire presented to them was applied in the pre-anesthetic a sensitivity of 93% to predict SAHOS and that was used to associate the presence of oxygen desaturation in the postoperative period. The study variables were: age in years in two groups over and under 50 according to the risk of SAHOS according to the questionnaire used in the study, sex, Body Mass Index, arterial hypertension, atrial fibrillation, presence of other arrhythmias, infarction to myocardium.

Two groups were formed according to the score obtained through the STOP-Bang questionnaire: greater than 3 and less than 3; where a score greater than 3 was considered STOP-Bang high. This questionnaire is easy to apply, so, once knowing the result of the questionnaire and filling out the collection instrument, which gathered the characteristic data of the study subjects, as well as reviewing their clinical file; By means of pulse oximetry, the percentage of oxygen saturation in the postoperative period was measured, being considered less than 90% as oxygen desaturation. With convenience sampling and non-probabilistic sample, the data of the variables were entered into an Excel sheet and subsequently in a statistical package spreadsheet where they were analyzed with means and standard deviation for quantitative variables, through proportions for qualitative and inferential with chi square to compare proportions being p <0.05 to be significant. Risks were measured with Odds Ratio (OR) with 95% confidence intervals; using statistical package SPSSv24.0.

RESULTS

121 patients scheduled for general anesthesia were reviewed, two groups were formed, STOP-Bang greater than 3 points with 85 and less than 3 points 36, resulting in a high STOP-Bang scale in 85 (70%) and less than 3 36 (30 %). Whose general characteristics showed age over 50 years with a frequency of 49 (58%) with high STOP-Bang and STOP-Bang less than 3 in 32 (89%). The male sex of 36 (42%) with high STOP-Bang and 22 (61%) less than 3. Morbid obesity was observed in 13 (15.3%) with high STOP-Bang and 2 (5.6%) with STOP-Bang less than 3. As shown in Table 1.

Table I. General characteristics of the study groups.
N= 121

| Characteristics	STOP-Bang High	STOP-Bang less than 3
	n= 85 (%)	n= 36 (%)
Age		
Over 50 years old	49 (58)	32 (89)
under 50 years	36 (42)	4 (11)
Sex		
Male	36 (42)	22 (61)
Female	49 (58)	14 (39)
Weight		
Normal weight	27 (31.8)	22 (61)
overweight	27 (31.8)	6 (16.7)
Obesity I	17 (20.0)	5 (13.9)
Obesity II	1 (1.2)	1 (2.8)
Obesity III	13 (15.3)	2 (5.6)

Source: Naval Medical Center

Table II. Frequency of cardiovascular complications in patients with application of the STOP-Bang questionnaire in preanesthetic assessment.
N= 121

Complications	STOP-Bang High	STOP-Bang less than 3	p
	n= 85 (%)	n= 36 (%)	
Riesgo cardiovascular			**<0.000
None	60 (70.6)	35 (97.2)	
Atrial Fibrillation	15 (17.6)	0	
Other arrhythmias	9 (10.6)	1 (2.8)	
Myocardial Infarction	1 (1.2)	0	
Hipertensión arterial			*<0.000
Was presented	52 (61)	5 (14)	
Absent	33 (39)	31 (86)	

Source: Naval Medical Center
*Chi square with Yates correction
**U de Mann Whitney

Graph 1. Oxygen desaturation with questionnaire results STOP-Bang high, applied in pre-anesthetic consultation
N= 121
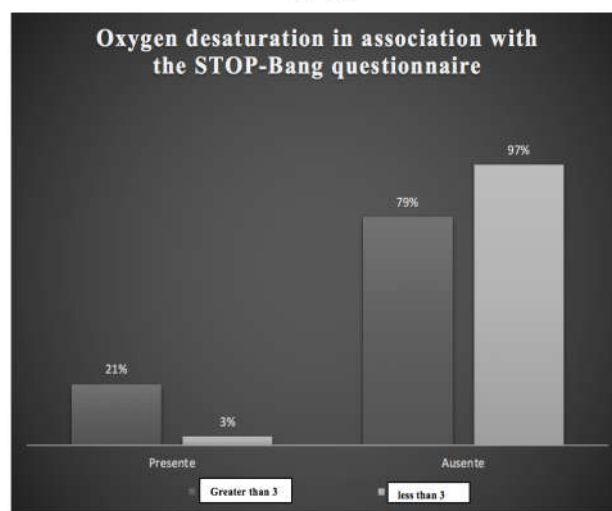
Source: Naval Medical Center
P< 0.012, Chi square with Yates correction
OR 9.4 (IC 95% 1.2-73.3)

On the other hand, the presence of atrial fibrillation is observed with 15 (17.6%), with high STOP-Bang, 0% STOP-Bang less than 3. Arterial hypertension in 52 (61%) with high STOP-Bang and 5 (14%) less than 3, <0.000. As shown in Table 2. The oxygen desaturation was 18 (21%) with a high STOP-Bang scale score and with a score less than 3, of 1 (3%), p <0.012, OR 9.4 (95% CI 1.2-73.3). As shown in graph 1.

DISCUSSION

In this study, 121 records of patients undergoing general anesthesia were reviewed, the majority of whom were under high STOP-Bang, whose age over 50 was in half of both study groups, as mentioned by Seet E, and collaborators, which report that in older patients higher STOP-Bang scores are shown, due to the comorbidity of these patients (Seet, 2015), In addition, arterial hypertension was more frequent in those who presented STOP-Bang high as mentioned in the study of Sett E. This comorbidity with high STOP-Bang increases cardiovascular risk in surgeries with general anesthesia, when the presence of atrial fibrillation and other arrhythmias is observed as the patients in our study, showing the STOP-Bang questionnaire with a score lower than 3, which the 92% were without cardiovascular comorbidity, their differences being significant.

The high STOP-Bang scale was shown in 85 (70%) of the patients, higher than an investigation by Pereira H, and collaborators; that, out of a total of 357, 52% were considered high risk according to the STOP-Bang scale, but their study these patients were with greater comorbidity (Pereira, 2013). Oxygen desaturation occurred in 18 (21%) with a high STOP-Bang scale score and 1 (3%) with a score less than 3, p <0.012, OR 9.4. Being lower in other studies by Reed K, in 2016, where frequencies greater than 50% are shown (Reed et al., 2016).

Conclusion

An association of oxygen desaturation with high STOP-Bang was observed, which was lower than in other studies, due to lower comorbidity.

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