Assessment of the Risk of Sleep Apnea Syndrome in Pre-Anesthetic Consultation for a Scheduled Intervention Under General Anesthesia at the University Teaching Hospital of Kamenge

Patrice Barasukana[1], Daniel Nduwayo[1], Thierry Sibomana[2]*, Eugene Ndirahisha[3], Stanislas Harakandi[4], Jean Bosco Bizimana[5] and Leopold Nzisabira[1]

[1]Department of Neurology, Kamenge University Hospital, Bujumbura, Burundi

[2]Department of Pulmonology, Kamenge University Hospital, Bujumbura, Burundi

[3]Department of Cardiology, Kamenge University Hospital, Bujumbura, Burundi

[4]Department of Anesthesiology and Intensive Care, Kamenge University Hospital, Bujumbura, Burundi

[5]Department of Neurosurgery, Kamenge University Hospital, Bujumbura, Burundi

*Corresponding Author: Thierry Sibomana, Department of Pulmonology, Kamenge University Hospital, University of Burundi, Burundi.

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Abstract

Aim: To assess the level risk of sleep apnea syndrome in patients undergoing pre-anesthetic consultation for a scheduled surgical intervention under general anesthesia at the University Teaching Hospital of Kamenge.

Patients and Method: It was a prospective descriptive study conducted on 53 patients, according to the STOP BANG questionnaire, from April 1 to September 30, 2019 in the Anesthesia and Resuscitation department of University Teaching Hospital of Kamenge. Was eligible for the protocol any patient programmed for an intervention under general anesthesia. The data were collected during the pre-anesthetic consultations and were entered in Excel and then processed by IBM SPSS Statistics software 25.

Results: The average age was 43 with extremes of 17 and 86. The sex ratio was 1.78 in favor of men. Sleep apnea syndrome with a high risk level was found in 24.5% of those surveyed. The medium and low risk levels were found in 9.4% and 66.0% respectively. High blood pressure and diabetes were the most common chronic conditions with 18.8% and 13.2% respectively. Sleep was rated good by 69.8% of respondents and 81.2% slept at least 8 hours a day.

Conclusion: The risk of sleep apnea syndrome is high in patients operated under general anesthesia at the University Teaching Hospital of Kamenge.

Keywords: Sleep Apnea; Pre-Anesthetic Consultation

Introduction

Sleep apnea syndrome is characterised by repeated obstructions of the upper airway during sleep resulting in repeated 'asphyxia' that repeatedly wakes the patient, thus impairing sleep quality [1]. Its incidence is high in the general population with an average age of 30 - 60 years. According to Konin C., *et al.* [2], 9 - 14% of men and 7 - 10% of women have moderate sleep apnea syndrome with an apnea-hypopnea index (AHI) greater than 15 per hour of sleep. These figures increase with age beyond 65 years [3]. In sub-Saharan Africa, this syndrome is poorly described. This lack of diagnosis is partly related to the absence of polysomnography laboratories in our environments [2].

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Sleep apnea syndrome has a double consequence: the lack of deep sleep causes daytime sleepiness, cognitive disorders and reduced quality of life, and on the other hand, the stress related to repeated "asphyxia" with hypoxemia and transient hypercapnia constitutes, and by increasing sympathetic tone, an increased risk of cardiovascular diseases such as arterial hypertension, myocardial infarction, stroke, and increases cardiac arrhythmia [1,4,5].

In addition, sleep apnea syndrome (SAS) exposes two complications in the operative period, namely difficulty with mask ventilation and intubation but also postoperative upper airway obstruction [6]. Knowledge of the pathophysiological consequences and especially the intra- and post-operative complications of SAS is a very important preventive measure, hence the interest of our work whose objective was to evaluate the level of risk of sleep apnea syndrome in patients undergoing pre-anesthetic consultation for a surgical procedure scheduled under general anesthesia at the Kamenge University Hospital Center (KUHC).

Patients and Methods

Our study was prospective and descriptive and included patients seen in pre-anesthetic consultation for scheduled surgery under general anesthesia at the Department of Anesthesia and Intensive Care of KUHC from April 1 to September 30, 2019.

The use of the STOP-BANG questionnaire was guided in particular by the fact that it is a score that has been validated in the pre-anesthetic consultation population in view of its high sensitivity, which increases with the severity of the sleep apnea syndrome, but also by its ease and speed of use [7].

The questionnaire consists of 8 questions. Each question has a binary answer: yes or no, and is scored as either 1 or 0. The risk level for OSA is low if the answer "yes" is 0 - 2 questions. Medium risk is 3 - 4 questions. High risk is a "yes" answer to 5 - 8 questions or yes to at least 2 of the first 4 questions + male sex or yes to at least 2 of the first 4 questions + BMI > 35 Kg/m^2 or yes to at least 2 of the first 4 questions + neck circumference (≥ 43 cm in men and 41 in women).

We included any patient scheduled for surgery under general anesthesia. Patients with ENT abnormalities that are part of the etiology of SAS by obstruction or reduction in size of the upper airways and patients who had scheduled surgery under local or loco-regional anesthesia were excluded.

The questionnaire was completed anonymously during the pre-anesthetic consultation after obtaining the patient's consent. The data collected concerned socio-demographic data, history or current, sleep quality, but also data from the STOP-BANG questionnaire.

These data were entered on a computer in Excel and then exported to IBM SPSS Statistics 25 software for processing and analysis.

Results

A total of 53 patients were selected, aged between 17 and 86 years with a median age of 43 years. The most common age groups were 40 - 49 years and 20 - 29 years, which accounted for 24.5% and 22.6% respectively.

Of these patients, 64.2% were male and 52.8% lived in rural areas. Regarding the level of education, 86.7% had attended at least primary school. According to occupation, 35.8% were farmers while 20.8% were civil servants.

The most frequent pathologies among our respondents were arterial hypertension (18.8%) and diabetes (13.2%), of which 5 diabetics out of 7 did not know what type of diabetes they had.

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Pathologies	Number	Percentage
Asthma	2	3,7
Pulmonary tuberculosis	1	1,9
Pneumonia	1	1,9
Hypertension	10	18,8
Heart failure	2	3,7
Endocarditis	1	1,9
Deep vein thrombosis	1	1,9
Stroke	1	1,9
Peripheral neuropathies	1	1,9
Diabetes	7	13,2

Table 1: *History or background.*

According to the quality of sleep, 81.2% slept at least 8 hours a day and 69.8% considered their sleep to be of good quality despite the fact that factors disturbing sleep were identified: night work (17.5%), use of devices with bright screens (24.5%) such as mobile phones, computers and television, but above all the absence of a favourable environment in the bedroom (37.7%).

Out of the 53 patients who were scheduled for surgery under general anesthesia, 13 (24.5%) had a high risk level of SAS, 5 (9.4%) had a medium risk level and 35 (66.0%) a low risk level.

Stop Bang		Number	Percentage
Snoring		22	41,5
Fatigue or daytime sleepiness		19	35,8
Breathlessness or choking/suffocating during sleep		4	7,5
Hypertension		10	18,8
BMI>35 kg/ m^2		6	11,3
Age >50 ans		20	37,7
Large neck size	Men ≥ 43 cm	1	7,5
	Women ≥ 41 cm	3	

Table 2: *Frequency of STOP BANG items.*

From this study, it was found that the risk level of OSAS was influenced by diabetes as their relationship was statistically significant. Chi-square compared to table chi-square (10.705 > 5.99).

		Risk level for OSAS						Total	
Low		**%**	**Me-dium**	**%**	**High**	**%**	**Num-ber**	**%**	
Diabetes	Yes	1	1,9	1	1,9	5	9,4	7	13,2
	No	34	64,1	4	7,5	8	15,1	46	86,8
Total		35	66,0	5	9,4	13	24,5	53	100
Chi square = 10,705					Chi square of the table=5,99				

Table 3: *Risk levels for OSAS and Diabetes.*

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Discussion

The objective of our study was to evaluate the level of risk of sleep apnea syndrome in patients scheduled for surgery under general anesthesia at the University Hospital of Kamenge. Indeed, 24.5% had a high risk level while 9.4% had a medium risk level. Loïc Géraud-Fontaine., *et al.* [8], in their study on the risk level of SAS in the department of visceral and vascular surgery at the University Hospital of Poitiers in France found that 22.4% had a high risk level.

Mehdi Ouamri., *et al.* [9] found a high risk level for sleep apnea syndrome of 31.6% in patients undergoing bariatric surgery at the University Hospital of Amiens in France and Obianuju Beatrice Ozoh., *et al.* [10] found 36.3% in patients attending a tertiary health facility in Lagos, Nigeria.

The average age of the respondents was 43 years with a male predominance of 64.2%, i.e. a sex ratio of 1.78 in favour of men. This age is observed in other studies, notably that of Mehdi Ouamri., *et al.* (42 years), Monalisa R. Bonciu., *et al.* (43 ± 13 years) and Obianuju Béatrice Ozoh., *et al.* (43.9 ± 16.1 years) [9-11]. Male predominance was also observed in the study by Obianuju Béatrice Ozoh., *et al*. at 53.4% [10].

Arterial hypertension (18.8%) and diabetes (13.2%) dominated the picture of diseases identified in our study population. Indeed, cardiovascular disease is the leading cause of death in the world, both in developed and developing countries [12]. However, the largest number of these deaths occurs in developing countries (80%) [12].

In Morocco, for example, according to El Boukhrissi F., *et al*. in 2017 [13], the two diseases were the leading cause of mortality and accounted for 30% of all deaths. Moreover, these same authors reported that more than 36% of adults (> 20 years) suffered from hypertension, 12.4% of the population had diabetes [13]. In Burundi, fragmentary studies reported that diabetes was the third most common cause of hospitalisation at the Kamenge University Hospital. Its prevalence was high in the cities, particularly in Bujumbura where a 2007 survey in the current Buyenzi zone found that 14.5% of the population had diabetes [14].

Sleep has always been recognised by all as an essential factor for psychological balance and physical and mental recovery, regardless of age, environment or state of health. It is also a pleasure that is inseparable from rest, personal and family time, an intimate part of our lifestyle [15].

The majority of our respondents (81.2%) slept at least 8 hours a day and 69.8% of these respondents felt they had good quality sleep. In France, the average sleep duration was 6 hours 42 minutes in 2017 [15] and in Canada [16] the average sleep duration was 7.12 hours and only 55% reported that their sleep was restful.

Night work was found in 17.5% of our respondents compared to 16.3% of respondents in France in 2013 [15]. Night work is accompanied by a desynchronisation of normal biological rhythms, based on the day-night alternation, which causes sleep disorders and in particular a reduction in daily sleep time.

In our study, 37.7% of our respondents did not have a favourable bedroom environment for good sleep quality. Various factors were identified as being at the origin of this poor environment, namely noise (35%), excessive heat (30%), the spouse (15%), bedding (20%) and light (5%).

Indeed, when we sleep, the body is at rest but continues to receive stimuli from the outside world. This is why sleep is fragile and can be disturbed by many environmental factors.

The medical consequences of insomnia are manifold. They include cardiovascular, respiratory, gastrointestinal, kidney and muscle disorders.

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Insomniacs are twice as likely to develop ischemic heart disease as good sleepers, and they also often have disturbances in their immune systems. Chronic sleep deprivation is also considered to have a major influence on metabolic and endocrine regulation and to contribute significantly to cardiovascular risk [17].

Conclusion

The risk of sleep apnea is high in patients undergoing pre-anesthetic consultation for scheduled surgery under general anesthesia at Kamenge University Hospital. Hypertension (18.8%) and diabetes (13.2%) are the main comorbidities identified. The majority of patients get enough sleep and have a restful sleep. Factors that hinder quality sleep are night work, the use of light screens in their bedrooms and environmental factors. It is necessary that anesthetists, especially those who do not have polysomnography in their technical platform, use the STOP BANK score to limit the anesthetic complications of sleep apnea syndrome.

Bibliography

1. Heinzer R and Aubert J-D. "Le syndrome d'apnées obstructives du sommeil". *Forum Médical Suisse* 7 (2007): 686-691.

2. Konin C., *et al*. "Présomption d'apnées du sommeil dans une population d'hypertendus Noirs africains: Intérêt de l'échelle de somnolence diurne d'Epworth dans l'approche diagnostique". *Annales de Cardiologie Et D'angeiologie* 64.4 (2015): 268-272.

3. Chung SA., *et al*. "A systemic review of obstructive sleep apnea and its implications for anesthesiologists". *Anesthesia and Analgesia* 107.5 (2008): 1543-1563.

4. Peppard PE., *et al*. "Prospective study of the association between sleep-disordered breathing and hypertension". *The New England Journal of Medicine* 342.19 (2000): 1378-1384.

5. Kanagala R., *et al*. "Obstructive sleep apnea and the recurrence of atrial fibrillation". *Circulation* 107.20 (2003): 2589-2594.

6. Kheterpal S., *et al*. "Incidence and predictors of difficult and impossible mask ventilation". *Anesthesiology* 105.5 (2006): 885-891.

7. Chung F., *et al*. "STOP-BANG questionnaire: a tool to screen patients for obstructive sleep apnea". *Anesthesiology* 108.5 (2008): 812-821.

8. Geraud-Fontaine L., *et al*. "Prévalence des patients à risque de syndrome d'apnées obstructives du sommeil (SAOS) en chirurgie viscérale et vasculaire". *Anesthésie and Réanimation* 1.1 (2015): A391.

9. Mehdi Ouamri RB., *et al*. "Utilisation du score de STOP-BANG dans le cadre du syndrome d'apnée obstructive du sommeil chez les patients candidats à la chirurgie bariatrique". *Anesthésie and Réanimation* 1.1 (2015): 336.

10. Ozoh OB., *et al*. "Prospective assessment of the risk of obstructive sleep apnea in patients attending a tertiary health facility in SubSaharan Africa". *The Pan African Medical Journal* 17 (2014): 302.

11. Monalisa R., *et al*. "Le score STOP-BANG prédit avec fiabilité les apnées du sommeil en préopératoire d'une chirurgie bariatrique". *Anesthésie and Réanimation* 1.1 (2015): 336-337.

12. Sellam EB and Bour A. "Prévalence des facteurs de risque de maladies cardiovasculaires chez la femme à Oujda (Maroc)". *Médecine des maladies Métaboliques* 10.1 (2016): 63-69.

13. El Boukhrissi F., *et al*. "Prévalence des facteurs de risque des maladies cardiovasculaires et du syndrome métabolique chez les femmes de la région de Meknès, Maroc". *Médecine des Maladies Métaboliques* 11.2 (2017): 188-194.

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14. République du Burundi; Ministere de la Sante Publique et de la Lutte Contre le Sida, Direction des Programmes et Services de Santé, Programme National Intégréde Lutte Contre les Maladies Chroniques non Transmissibles. Plan Stratégique National de Lutte Contre les Maladies Chroniques non Transmissibles 2011-2015 (2011).

15. Damien LFB. "Le temps de sommeil en France. Bulletin Epidémiologique Hebdomadaire, 12 Mars (2019): 8-9.

16. Jean-Philippe Chaput SLW. "Isabelle Michaud. Durée et qualité du sommeil chez les Canadiens âgés de 18 à 79 ans Statistique Canada, no 82-003X au catalogue". *Rapports sur la santé* 28.9 (2017): 30 -35.

17. Sellam EB and Bour A. "Prévalence des facteurs de risque de maladies cardiovasculaires chez la femme à Oujda (Maroc)". *Médecine des maladies Métaboliques* 10.1 (2016): 63-69.

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