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RESEARCH ARTICLE

Epidemiological, Clinical, Paraclinical and Progressive Aspects of Patients Followed for Obstructive Sleep Apnea/Hypopnea Syndrome in a Private Cardiology Clinic

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Abstract

Introduction: Obstructive Hypopnea Sleep Apnea Syndrome (OSAHS) is a common respiratory disorder among sleep disorders. More precisely, it is a nocturnal pathology corresponding to a more or less complete inspiratory collapse of the hypopharynx. It is a relatively frequent pathology yet under-diagnosed. The objective of this study is to analyze the epidemiological, clinical, paraclinical and evolutionary aspects of patients who underwent treatment for OSAHS.

Methods: This is a retrospective descriptive and analytical study over 24 months (from April 1st, 2015 to March 31st, 2017) conducted in a private cardiology department in Dakar. Two hundred and ten patients with suspicionof OSAHS were collected.

Results: The average age of the population was 51.13 years and the most represented age group was (50 to 60 years). The sex ratio was 1.2 in favour of men. Family ronchopathy was present in .33% of cases. Obesity was present in 30.95% of cases. The other antecedents were found in different proportions: hypertension (53.81%), diabetes (19.52%), dyslipidemia (18.57%), coronary artery disease (8.1%), valvulopathies and apnea (17.62%). Respiratory polygraphy was performed in all patients and had established (4.29%). Clinical symptomatology was dominated by night snoring (86.67%), EDS (49.05%), insomnia (20.48%) an OSAHS of 87.61% in cases (n=184). Hygieno-dietary measures were instituted in all patients. Eighty-two patients were fitted by PPC with success.

Conclusion: OSAHS is a risk factor for cardiovascular disease. However, treatment by apparatus. Continuous Positive Pressure remains the cornerstone for improving the prognosis of OSAHS.

Keywords: OSAHS; Clinical and Para clinical Aspects; Cardiovascular Risk Factor

Introduction

Sleep disorders include a wide range of manifestations. A sleep disorder (somnipathy) is a medical condition that can have physiological, environmental or behavioral causes. According to the International Classification of Sleep Disorders – Third Edition (ICSD-3) [1], disorders are grouped into six major categories: Insomnia, Sleep Related Breathing Disorders.

Central Disorders of Hyper somnolence, Circadian Rhythm Sleep-Wake Disorders, Parasomnias and Sleep Related Movement Disorders.

Sleep disorders are very common in the general population. According to a multi-center study conducted by a team from Warwick Medical School and supported by the World Health Organization (WHO) in eight countries in Africa and Asia, the prevalence of sleep disorders was 16.6% [2]. This figure is very close to Western countries where 20% of the population complains of sleep disorders [3]. Despite their high frequencies, they remain poorly identified: less than 20% of individuals with sleep disorders are correctly diagnosed and treated [4].

Obstructive Sleep Apnea Hypopnea Syndrome (OSAHS) is a nocturnal pathology corresponding to a complete inspiratory collapse of the hypo pharynx. It is characterized by the occurrence, during sleep, of abnormally frequent episodes of ventilation interruptions (apnea), or significant reductions in ventilation (hypopneas). We studied this pathology in patients treated at a private cardiology clinic in Dakar with the following objectives.

General purpose is

To describe the epidemiological profile, the risk factors and the diagnostic, therapeutic and progressive aspects of OSAHS in all patients followed for suspicion of obstructive hypopnea/ apnea syndrome at the SANIKE Cardiology Clinic during the period from April 2015 to March 2017.

Specific objectives are

- To evaluate the prevalence of OSAHS in patients with cardiovascular disease and according to the type of heart disease
- To compare the types of OSAHS according to the severity of the extractive polygraphy
- To state the results of the management and evolution of the studied patients

Methods

Type and scope of study

This is a retrospective, descriptive and analytical study carried out over a period of 24 months: from April 1, 2015 to March 31, 2017. This study was conducted in a Cardiology Clinic located in Fann Hock, a residential area on the West Corniche of Dakar.

Population of the study

All patients suspected of OSAHS regardless of gender, ethnicity or socio-economic class. Symptoms include excessive daytime somnolence, non-refreshed sleep, nocturia, loud snoring, apneas and choking during sleep, morning headaches, and sexual dysfunction.

Inclusion criteria

Were included patients admitted in consultation or hospitalized in the clinic, and who were the subject of research of OSAHS during the same period.

Was suspected any patient presenting a symptomatology evoking an OSAHS, and having been the subject of search of OSAHS by a ventilatory polygraph.

A confirmed case of OSAHS is any suspicious case whose ventilatory polygraph has found an apnea-hypopnea index (AHI) greater than or equal to 5 / hour of sleep.

Criteria for non inclusion

Are not included patients admitted for search of OSAHS and whose data are not available and those for whom a ventilatory polygraphy was not performed.

Exclusion criteria

All patients with evocative signs of Shos who do not wish to participate in the study all patients with evocative signs of OSAHS who do not wish to participate in the study.

Tools for collecting data

Data collection is done with patient's records. The collection of data was done on an Excel file. The following parameters were studied:

➢ Civil status of the patient: age, sex, marital status, professional activity.

Patient history:

- Family history: family ronchopathy, OSAHS
- Cardiovascular personal history: particularly obesity, diabetes, hypertension, dyslipidemia, transient ischemic attack (TIA) or stroke, coronary artery disease, valvulopathy, arrhythmia and conduction disorder.
- Non-cardiovascular personal history: spasmophilia, asthma, gastritis, gastroesophageal reflux disease.

Clinical signs:

- Symptoms suggestive of OSAHS: such as excessive daytime sleepiness (EDS), nocturnal snoring, apneas or nighttime breathing pauses, insomnia detected by the main clinical parameters of the evaluation of insomnia who are: the latency of falling asleep; the duration of waking during the night; the number of these nocturnal awakenings; early morning awakening; total sleep time; the effectiveness of sleep; the diurnal state: disorders of attention, irritability Other symptoms: morning headaches, daytime fatigue, nocturia, migraines, libido disorders, memory and concentration disorder.

Physical examination: We studied

- Obesity: determined by the mass index. It was considered normal between 18 and 25, overweight between 25 and 30, minimal obesity between 30 and 35, moderate obesity between 35 and 40 and morbid obesity beyond 40.
- Arterial pressure (AP): a systolic BP is considered with an AP> or equal to 140 mmhg and a diastolic BP, an AP > or equal to 90 mmhg. The term "non-dipper" is devoted to the suppression of the physiological decrease of blood pressure during sleep.
- Oxygen saturation in ambient air (SPO2 AA): normal if > or equal to 94%, and is called oxygen desaturation if it is < 94% in ambient air [5].

Review of devices

It is mainly focused on the cardiovascular system looking for arrhythmia and on the respiratory system. However the review of all devices and system was done.

Paraclinic:

Biology: the studied parameters are: fasting glucose, glycated hemoglobin (HBA1c), lipid balance, serum uric acid.

Morphology: the studied parameters are: ECG, cardiac Doppler ultrasound, ABPM (Ambulatory Blood Pressure Measurement), Cardiac exercice stress testing, spirometry, Cidelec respiratory polygraphy.

Procedure of realization for the polygraphy: the examination takes place in the patient's home, the doctor shows the patient how to apply the sensors himself before sleeping, based on a diagram that is given to him. The somnologist doctor can then interpret the results of the examination and decide whether or not to complete it. It allowed: to make the diagnosis by hypopnea apnea index (AHI) greater than 5 per hour; to appreciate the severity of the OSAHS; the severity of ronchopathy; to evaluate the degree of desaturation; and to differentiate between central and obstructive apneas. It was also used to validate a CPAP installation.

The Apnea / Hypopnea Index are calculated by the following formula:

AHI= (number of apneas + number of hypopneas) / duration of sleep (hour)

This index makes it possible to characterize the severity of the OSAHS. There are three degrees of increasing severity: light OSAHS: AHI / h between 5 and 15; moderate OSAHS: AHI / h between 15 and 30, severe OSAHS: AHI / h greater than 30.

Treatment: we evaluated the different therapeutic modalities

The hygiene and dietary measures: focused mainly on regular physical activity, stopping the intake of alcohol and sleeping pills, stopping smoking.

Drug treatment: for symptomatic purposes and treatment of underlying diseasess

Instrumental treatment: Continuons Positive Pressure (CPAP) ventilation with face mask or nasal mask. A nasal mask was offered to patients in case of discomfort of the facial mask.

Evolution and monitoring:

The evolution is said favorable if a clinical improvement is noted, associated with a normal control AHI. Incomplete improvement is seen if the control AHI tends to normalize but still exceeds 5 / h with an improvement of the symptoms.

Failure is characterized by the persistence of the clinical picture with persistent AHI, despite treatment being initiated. As for worsening, the symptoms and the AHI become more and more severe.

Statistical analysis of the data

The studied parameters were collected in the patient's electronic file and then entered from the Excel software. Data analysis was done with the software EPI INFO 7 then EXCEL. The univariate analysis made it possible to determine the distribution of each variable to be studied. And the bi-varied analysis consisted in studying the variables taken in couples, via descriptive techniques.

The limits of the study

During the course of this study, we were confronted with some difficulties related to the non-prospective nature of the study, thus limiting the complete evaluation of all the clinical parameters and the incomplete reports of the respiratory polygraphies.

Results

Descriptive study

General population (suspected cases)

a. Epidemiological data

Two hundred and ten (210) patients had clinical signs of suspicion of OSAHS.

The average age of the population was 51.13 years (range: 12 to 88 years) and a median age of 51 years. The most represented age group was between 50 and 60 years old. The male gender was predominant and accounted for 54.76% of the population (115 individuals) with a sex ratio of 1.21. Eighty-three percent (n = 176) of our patients were married.

b. Clinical data

A family history of ronchopathy was found in 3.80% of cases (n = 7). More than the majority of subjects, 63.80% had at least one history of cardiovascular disease. Hypertension was the major factor found in 53.81% of patients, followed by diabetes 19.52% and dyslipidemia 18.57% (Figure 1).

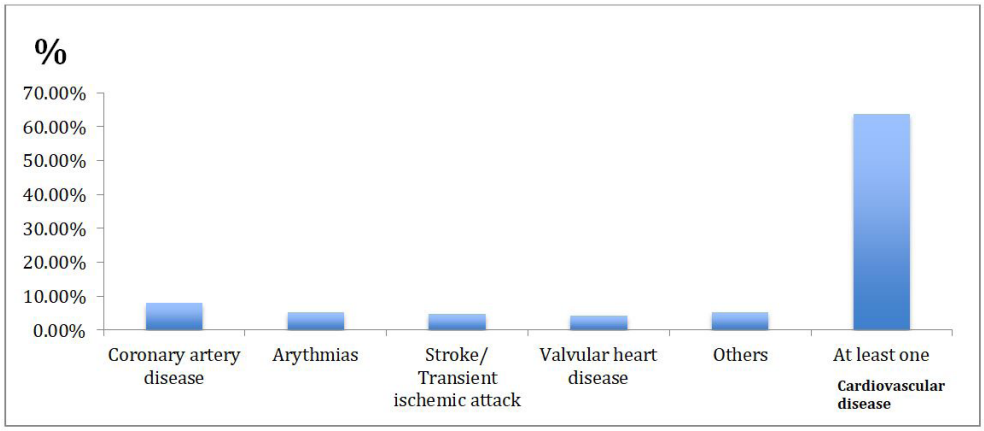

Figure 1: Distribution according to prevalence of cardiovascular diseases in medical past history in general population (suspicious cases)

Symptoms suggestive of OSAHS	Number of cases	Percentage (%)	CI to 95 (%)
Excessive daytime sleepiness (EDS)	103	49,05	42,10-56,02
Nocturnal snoring	182	86,67	81,31-90,95
Apnea	37	17,62	12,72-23,46
Insomnia	43	20,48	15,23-26,57
Restless sleep, nocturnal sleep-wake, startup wake	25	11,90	7,85-17,07
At least one symptom of the triad (excessive daytime sleepiness, snoring, apnea)	197	93,81	89,65-96,86

Table 1: Repartition of symptoms suggestive of OSAHS in suspicious cases with confidence interval

It was noted that the majority of patients had at least one of the symptoms of the classical triad: excessive daytime sleepiness (EDS), snoring and apnea. The majority of patients (50.95% of cases) had morning headaches and daytime fatigues (44.29%) (Table 1). Patients with moderate obesity were predominantly 65.15%, yet 10.61% of the patients were morbidly obese. Systolic hypertension was observed in 40.21% of cases (n = 75) and diastolic hypertension in 35.44% of cases (n = 66). The average oxygen saturation at room air was 98.23% (range: 71.00% and 99.00%).

c. Paraclinical data

- Biology

Among our suspected cases of OSAHS: 35 (16.66%) were diabetic with 21 of them unbalanced (HBA1c disturbed), 32 (15.23%) had a disturbed lipid status and 18 (8.57%) had hyperuricemia.

- Respiratory polygraphy

Respiratory polygraphy was performed in 184 patients, or 87.61%, and all had OSAHS with an average AHI at 8.30 (range 0 to 84). All patients with a history of stroke and transient ischemic attack (TIA) (5.43%; n = 10) had pure obstructive apneas. Similarly, all patients with coronary artery disease (9.24%, n=17 cases) had an OSAHS confirmed with respiratory polygraphy.

- Cardiovascular abnormalities

Electrocardiogram was performed for 94.28% of patients (n = 198). It was pathological in 59 patients (28.09% of subjects). Frequently found pathologies were hypertrophies (atrial and / or ventricular) (13.14% or 25 patients), extrasystoles (atrial and / or ventricular) in 4.59% (i.e 09 patients). Echocardiography was performed in 111 patients (52.85% of cases). It was pathological in 25 patients, and found dilated cardiomyopathy with impairment of LVEF in 15 patients (7.14%), valvulopathy in 06 patients (2.86%), and other abnormalities: 4.32% or 09 patients. Ambulatory measurement of blood pressure was performed in 10 patients (4.76% of suspected cases). It was pathological about the 6 cases. We noted 03 cases of severe systolic-diastolic hypertension, 02 cases of moderate systolic-diastolic hypertension and 01 case of pure nocturnal systolic hypertension. The stress test was performed only in 04 patients (i.e 1.90% of suspected cases). It was pathological only on 01 case, which had objectified a ventricular extrasystole of trigeminal efforts with a tensional profile adapted to the effort.

- Spirometry

Spirometry was performed on 21 patients (10% of suspected cases). It was pathological in 3 cases (1.42%). There were 2 cases of minor restrictive syndrome and 1 case of predominantly restrictive mixed ventilatory disorder.

d. Therapeutic and evolutionary data

Health and dietary measures were introduced for all our patients. In the suspected cases, 31 patients (14.76%) had been weight-reduced by lifestyle and dietary measures associated with bariatric surgery in four patients. In the suspected cases, the percentage of patients with OSAHS but non-fitted was 48.57% (n = 102) while 82 patients had received CPAP.

The different specific treatments introduced were mainly related to the underlying field.

In the suspected cases, 131 patients (62.38%) were on medical treatment alone and the progression was favorable in 121 patients (92.37%). A slight improvement was noted in 05 cases (3.82%), one death in a patient with an AHI at 5 / h and 04 cases of failure (or 3.05%). The equipment was effective in 81 patients out of 82 cases (98.78%) of OSAHS.

Confirmed cases of OSAHS

a. Epidemiological data

OSAHS was confirmed in 87.62% of suspected cases (n = 184). The average age of the population was 52.13 years (range: 12 to 88 years) with a median age of 52.50 years. The most represented age group was between 50 and 60 years old. The sex ratio between men and women was 1.38.

b. Clinical data

All subjects with a family history of ronchopathy were screened for OSAHS (3.80%, n = 7). Cardiovascular personal history in confirmed cases was largely dominated by high blood pressure (55.98%), followed by diabetes (20.11%) and dyslipidemia (17.39%).

The average BMI of patients with OSAHS was 28.26 kg / m2 (range: 16.32 kg / m2 and 45 kg / m2). Obese accounted for 35.87% of the population, with morbid obesity in 10.61% of cases. Systolic hypertension was observed in 36.40% of cases and diastolic in 32.59%. All confirmed cases had at least one of the leading symptoms of OSAHS (SDE: 52.72%, snoring: 87.50% and apnea: 18.48%). Among the other symptoms, morning headaches dominated the chart in 47.83% of cases.

c. Paraclinical data

- Biology

Of the confirmed cases, 14 patients had diabetes and were all unbalanced. Twenty-three patients had a disturbed lipid status.

- Respiratory polygraphy

The average snoring index was 309.94 (range: 0 to 1557.10). The average AHI was 25.53 / H (range: 5 / H and 84 / H). The proportion of patients with severe OSAHS was 34% (n = 63). According to the nature of OSAHS, pure obstructive apnea accounted for 55.98% of cases (n = 103). Mixed apnea was 44.02% of cases (81 patients, including 80 cases of predominantly obstructive mixed apnea and 1 case of predominantly central mixed apnea). No cases of pure central apnea were found in the study.

- Cardiovascular abnormalities

The electrocardiogram was performed in 172 patients with OSAHS (93.47%) with 52 cases of pathological ECG. Abnormalities were dominated by atrial and / or ventricular hypertrophy. Cardiac ultrasound was performed in 97 OSAHS patients (52.71%) with 23 cases of pathological ultrasonography. In our study, coronary artery disease was found in 8.10% of suspected cases (n = 17) and all had OSAHS.

- Biology

Of the confirmed cases, 14 patients had diabetes and were all unbalanced. Twenty-three suspected cases (n = 17) and all had OSAHS. The prevalence of valvulopathies in confirmed cases was 4.35%.

• Therapeutic and evolutionary data

- Weight reduction

In confirmed cases, 57.06% were on medical treatment alone. The weight reduction was done on 16.30% of cases. Only one case of death was deplored. He was a patient with a mild obstructive OSAHS, which did not require fitting, but also had a history of heart disease and stroke.

- CPAP

Eighty-two apneic patients (44.57%) were fitted. Good therapeutic compliance was noted in almost all patients with one (01) case of loss of follow-up. Reported side effects were: skin irritation, rhinitis and conjunctivitis in 3% of patients. The outcome was favorable in 98.78% of cases (n = 81) with normal control AHI after 03 to 9 months, then 12 months of treatment. Only 01 patient had a control AHI at 9 months at 21 / H.

Descriptive study

Comparative analysis of unconfirmed cases to confirmed cases

- **Epidemiological data**

In confirmed cases, the average age was 52.13 years higher than the 42.46 years found in unconfirmed cases. The most representative age group was between 40 and 70 years in apneic patients and 30-60 years in unconfirmed cases. The sex ratio was in favor of women among the unconfirmed and men among the confirmed, respectively 0.44 and 1.38.

In both unconfirmed and confirmed cases, the proportion of married subjects was higher, respectively 84.62% (n = 22) and 83% (n = 153).

- **Clinical data**

A history of familial ronchopathy was found in 3.80% of patients with OSAHS (n = 7) and no case in unconfirmed patients. The prevalence of hypertension and diabetes was greater in apneic patients, respectively 55.98% and 20.11% against 34.62% and 15.38% in non-apneic patients. The prevalence of obese subjects was higher in confirmed cases, ie 35.86% versus 34.61% in unconfirmed cases. The proportion of systolic hypertension was higher in the confirmed cases than in the unconfirmed cases, namely respectively 36.40% (n = 68) and 30.77% (n = 8), the same for the diastolic hypertension with 25% respectively in confirmed cases (n = 46) and 23.08% in unconfirmed cases (n = 6) (Table 2).

Suggestive symptoms	Unconfirmed cases		confirmed cases		P- value (P)
	En (n)	En (%)	En (%)	En (n)	
Excessive daytime sleepiness	06	23,08	52,72	97	0.0
Nocturnal snoring	21	80,77	87,50	161	0.34
Respiratory apnea	04	15,38	18,48	34	0.70
Insomnia	06	23,08	20,11	37	0.75
Restless sleep, nocturnal sleep-wake, startup wake	02	07,69	12,50	23	0.47

Table 2: Data related to symptoms suggestive of OSAHS of unconfirmed cases to confirmed cases with *P-value*

- **Paraclinical data**

- **Respiratory polygraphy**

Patients with OSAHS had more severe desaturation during night polygraphy than non-apneic patients with an average minimum SPO2 of 71% and 80.88%, respectively. All apneic patients desaturated at night. Rönchopathy was more severe in apneic patients with a snoring index of 309.94 versus 98.88 in non-apneic patients.

- **Cardiovascular abnormalities**

There were more cases of pathological ECG in confirmed cases (52 patients) than in unconfirmed cases (06 patients). These pathologies were dominated by atrial and / or ventricular hypertrophies. Cardiac abnormalities predominated in patients with OSAHS (23 patients) compared to unconfirmed cases (02 patients). These pathologies were dominated by dilated cardiomyopathies.

- **Therapeutic and evolutionary data**

- **Hygiene and dietary measures**

In confirmed and non-fitted cases (55%, n = 102), only one (01) patient had benefited from a weight reduction (of 2kg over 3 months) by simple lifestyle and dietary measures. While in confirmed cases under CPAP associated with dietary and lifestyle measures, 30 patients (36.58%) had benefited from a weight reduction.

- **Symptomatic and specific treatment**

Among the symptomatic treatments, anxiolytics were the most prescribed, ie 18.48% of confirmed cases and 10% of unconfirmed cases with a significant P value (P = 0.0152). Followers were analgesic palliative II (18.48% vs 08%) and antimigraine / vertiginous (11.96% vs 5%). Other specific treatments were dominated by the treatment of cardiopathy (66.30% of OSAHS and 46.15% of non-OSAHS) and antihypertensive treatment (63.59% of OSAHS and 38.46% of non-OSAHS).

- **CPAP**

The outcome was favorable in all patients (81/82) under CPAP with 1 loss of view compared to 90.47% of patients with SAS not paired.

Comparative analysis of confirmed cases according to the severity of OSAHS

Sixty-three patients (34%) had severe OSAHS with an AHI> 30 / hour.

- **Epidemiological data**

The average age increased with the severity of OSAHS with 55, 18, 54.18 and 47.46 years respectively for severe, moderate to light OSAHS. Whatever the degree of severity, the predominant age group was between 50 and 60 years. The OSAHS was much more severe in men compared to women with 26.41%, 32.07% and 43.45% respectively compared to 23.37%, 27.27% and 42.58% in women (Figure 2).

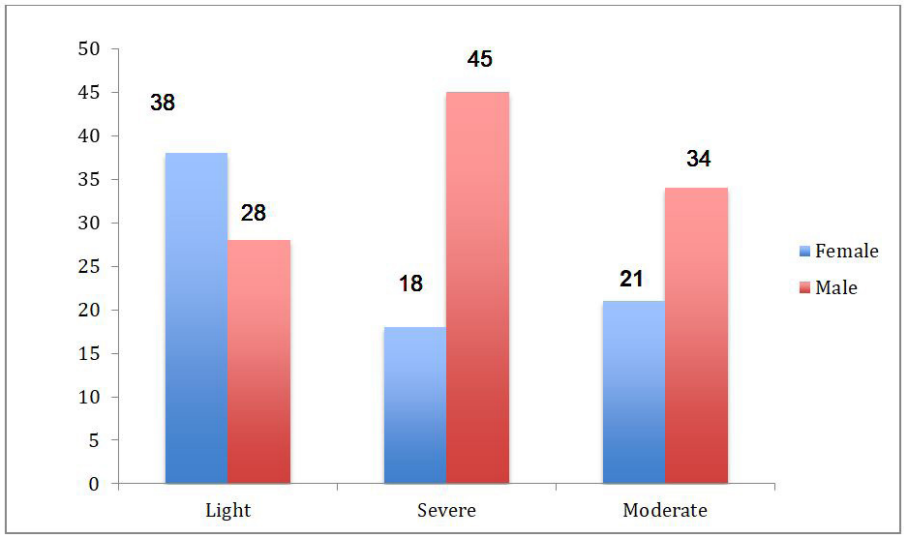

Figure 2: Distribution of subjects according to gender and severity of OSAHS and based on number of cases

- **Clinical data**

The proportion of subjects with familial ronchopathy increased with the severity of the disease with respectively 3.03%, 3.64% and 4.76% for mild, moderate to severe OSAHS. High blood pressure was the most represented cardiovascular risk factor. Its prevalence increased with the severity of OSAHS ranging from 45.45% to 66.67%. The severity of OSAHS correlated with an increase in average BMI of 27.78 kg / m^2, 28.06 kg / m^2 and 28.98 kg / m^2 respectively for mild, moderate and severe OSAHS. Similarly, the prevalence of systolic-diastolic hypertension was also correlated with the severity of OSAHS with percentages of 32.73%, 34.84% and 35.71%, respectively.

The prevalence of excessive daytime sleepiness was higher in severe OSAHS with respectively 45.45%, 45.45% and 66.67% for mild, moderate to severe OSAHS. Nighttime snoring also increased with the severity of OSAHS being respectively a prevalence of 81.82%; 87.27% and 93.65% for mild, moderate to severe forms.

- **Paraclinical data**

Respiratory polygraphy

The severity of OSAHS correlated with the increase in the snoring index. There was a respective average index of 243.77; 274.97 and 413.92 for mild, moderate to severe forms. The desaturation severity was correlated with the severity of OSAHS with average values of 4.74, 9.10 and 19.40 for mild, moderate to severe OSAHS. According to the severity of the OSAHS, averages AHI were respectively 9.11 / H; 20.53 / H and 45.70 / H for mild, moderate to severe OSAHS. A peak AHI of 84 / H was observed in severe OSAHS.

- **Analysis of therapeutic and evolutionary data**

The prevalence of weight loss was higher in moderate OSAHS cases, followed by severe OSAHS cases i.e. 20.00% (n = 11) and 17.46% of cases (n = 13), respectively.

Medical treatment alone was less effective when OSAHS was severe with 16.67% failure of treatment. Progression under CPAP was favorable regardless of the degree of severity of the disease.

Discussion

Socio-demographic data

The average age of our study population was 51.13 years (range, 12 to 88 years). It was higher in apneic patients than in non-apneic patients, at 52.13 years and 42.46 years respectively. The average age increased with the severity of this disease, being respectively 47.46 years, 54.18 years and 55.18 years for mild, moderate to severe SAHOS. Our average age in apneic patients was close to that found by Mboup W and Co [6] in 2017 (52.98 years). In our study, the male gender was predominant among confirmed cases (sex ratio = 1.38). This predominance of the male sex was correlated with the severity of OSAHS. Other studies

corroborated our results. Bodez and Co, in 2015 [7], and Lefèvre-Dognin [8] found respectively a male predominance of 83.5% and 75%. Male predominance can be explained by the fact that the male gender is a cardiovascular risk factor and therefore a comorbid factor. The proportion of married subjects in both confirmed and unconfirmed cases was 84.62% (22 patients) and 83% (153 patients) respectively. The immediate environment plays an important role in the diagnosis and management of apneic patients.

Medical past history

- Family Ronchopathy

In our study, only family history of ronchopathy was sought. Its prevalence was low but increased with the severity of OSAHS i.e. respectively 3.03%, 3.64%, and 4.76% for mild, moderate to severe forms. Kamila SO and Co. [9] studied on 34 non-obese patients who presented severe SAS, a prevalence of family ronchopathy greater than in our study (70%). What allows us to say that family ronchopathy is a risk factor for OSAHS. This can be explained by some genetic factors involved in the presentation of this disease.

- Cardiovascular risk factors:

• Hypertension:

In our study, personal history was dominated by hypertension, which was higher among confirmed patients, i.e. 55.98% versus 34.62% among unconfirmed patients with a p-value of 0.036. The prevalence of hypertension was correlated with the severity of OSAHS.

Souki and Co, in a prospective comparative study in 2014, showed that OSAHS appears to be more severe in hypertensive patients [10]. This high prevalence of hypertension during OSAHS can be explained by the predisposing and constitutive factors of cardio-vascular co-morbidities.

• Diabetes:

In our study, the prevalence of diabetes was higher in patients with OSAHS (20.11%) than in those without OSAHS (15.38%) with a p-value at p = 0.5695. Sebei and Co [11], in a 2016 retrospective study of 214 patients with SAS, had prevalence greater than our 26% of Type 2 diabetics. The duration and quality of sleep are clearly related to glycemic control (hbA1c). In diabetics, the level of HBA1c is correlated with the severity of OSAHS, itself correlated with cardiovascular risk [12]. The OSAHS promotes the imbalance of diabetes and its angiopathic consequences.

• Dyslipidemia:

Like diabetes, dyslipidemia was also found in our study in apneics in a greater proportion (26.92%, n = 49) than in unconfirmed cases (17.39%, n = 32). OSAHS induces disturbances of the lipid balance. It is associated with an increase in triglycerides (Tg) and a decrease in HDL-cholesterol (HDL-c). The increase in Tg and the decrease in HDL-c are secondary to an increase in sympathetic activity and secretion of cortisol in the context of OSAHS.

• Other antecedents:

Non-cardiovascular personal history was dominated by spasmophilia (30.77% in unconfirmed cases and 10.87% in confirmed cases) with a p value of 0.0052. Hyperuricemia was also common in apneic patients (17.39%). According to the authors, OSAHS, via the hypoxia that it causes, creates an acceleration of the turnover of purine nucleotides and therefore a greater production of uric acid responsible for gout attacks [13]. All patients with asthma in our series (10.33%, n = 19) had OSAHS. Souki and Co in 2014 on a prospective 12-month study of 100 patients hospitalized for suspicion of SAS had found 23% of asthmatics [14]. There is no causal link between asthma and SAS. These two conditions, asthma and sleep apnea, mutually reinforce each other and lead to a life-threatening oxygen deficiency.

Clinical data

In our study, major manifestations of OSAHS were dominated by nocturnal snoring followed by excessive daytime sleepiness. The prevalence of snoring was higher in confirmed OSAHS cases than in our unconfirmed patients with 87.50% and 80.77% respectively with a non-significant P (P = 0.34). Similarly, excessive daytime sleepiness accounted for 52.72% and 23.08%, respectively, with a p-value of 0.04. Indeed, these symptoms are very suggestive of OSAHS. Youssfi and Co [15], on a comparative prospective study, found a higher prevalence of nocturnal snoring and daytime hypersomnolence, respectively 100% and 75% of patients. Our study also showed that the prevalence of excessive daytime sleepiness and snoring increased with the severity of OSAHS with 45.45%, 45.45% and 66.67%, respectively and 81.82%, 87.27% and 93.65%. The prevalence of nocturnal apnea was relatively low but predominated in apneic patients (18.48%) versus 15.38% in unconfirmed cases with a p-value of 0.02. The Young and Co study of a sample of 5615 subjects showed that the daily, very noisy snoring and apneas observed frequently by the patient's entourage are associated with an increased risk of having an AHI greater than or equal to 15 / h [16]. Insomnia was more frequently found in unconfirmed cases (23.08% of cases) than in confirmed cases (20.11%) and this prevalence decreased with the severity of OSAHS. This could be explained, on the one hand, by the fact that insomnia is an integral part of sleep pathologies.

Morning headaches were in the foreground with 76.92% in unconfirmed cases and 47.83% in confirmed cases (with significant P-value P = 0.05). The least common symptoms in confirmed cases were: palpitation (32.61%), migraines (13.50%), nocturia (9.78%), mood disorders (3.81%), and concentration disorders (3.80%). These main symptoms are the repercussions of poor sleep quality and can lead to depression.

In our study, average BMI was slightly higher in sleep apnea patients than in unconfirmed patients, at 28.26 kg/m^2 and 26.62 kg/m^2, respectively. An average BMI of 27.35 +/- 4.3 kg / m^2 was found by Ben Ahmed and Co [17]. This high prevalence of obesity during SAS shows that they are two strongly related entities. In patients with OSAHS, the average minimal nocturnal desaturation was 71% (range: 31% and 93%). Ben Ahmed and Co found an average oxygen saturation of 93.17% with minimal saturation at 83.35% [17]. Whatever the severity of OSAHS was, a systolic-diastolic HTA was found in about 1out of 3 cases, but this prevalence was higher in the case of severe OSAHS (p HTAS = 38.10%, p HTAD = 33.33%). The relationship between OSAHS and hypertension has been established for years.

Paraclinical data

➢ **Biology**

There were more unbalanced diabetics in patients with OSAHS than in the unconfirmed group with fourteen [14] confirmed cases and seven [7] unconfirmed cases with a p-value of 0.4365 respectively. Several studies report a correlation between the severity of OSAHS and glycated hemoglobin (HbA1c). The link between OSAHS and glycoregulation disorders is explained by the iterative episodes of nocturnal hypoxemia and sleep fragmentation, leading to sympathetic hyperactivity, activation of the corticotropic axis, an increase in oxidative stress and inflammation, as well as changes in adipokine secretion: all these mechanisms contribute to insulin resistance and / or pancreatic dysfunction [18]. Regarding the lipid balance, 9 patients or 34.61% of unconfirmed cases and 23 patients or 8.57% of confirmed cases had dyslipidemia. Hyperuricemia was found in 4 non-OSAHS patients and 14 OSAHS patients. According to some authors, the hypoxia caused by OSAHS creates an acceleration of the turnover of purine nucleotides and therefore a greater production of uric acid responsible for gout attacks.

➢ **Imagery**

• **Cardiac abnormalities:**

There was also a clear predominance of electrical abnormalities in patients with confirmed OSAHS (52 cases) compared to unconfirmed patients (06 cases). Hypertrophic cardiopathy was the most common ECG pathology in apneic patients (50% of pathological ECG, n = 26). The prevalence of other heart diseases in the ECG was dominated by: right limb blocks (17.31%, n=9), extrasystoles (15.38%, n = 8). Ultrasonography was pathological in 12.5% or 23 patients with OSAHS. In addition to the ECG, the prevalence of echocardiographic abnormalities was also correlated with the severity of OSAHS. They were dominated by dilated heart disease with mild to moderate impairment of LVEF (56.52% of pathological cases).

Bodez and Co [19] found an alteration of diastolic function in 32.7% of patients, and showed that none of the SAS severity parameters were independent predictors of diastolic dysfunction. In the literature, there is a relationship between the severity of LV diastolic dysfunction and the severity of SAS [17]. Ambulatory measurement of blood pressure was performed in 10 suspected patients (4.76% of cases). It was pathological on the 6 patients, all carriers of an OSAHS. We noted: 03 cases of severe systolic-diastolic hypertension, 02 cases of moderate systolic-diastolic hypertension and 01 case of pure nocturnal systolic hypertension. AMBP (ambulatory blood pressure monitoring) plays an important role in the diagnosis of hypertension, especially in non-dipper OSAHS patients and in masked hypertension.

• **Respiratory polygraphy:**

The average snoring index was significantly higher in apneic patients than in non-apneic patients with 309.94 and 90.98 respectively with a p-value of 0.1144. Snoring is present in more than 90% of cases of sleep apnea syndrome. In contrast, in a sample of the population, only 10% of snorers have the syndrome [20]. C Aron and Co [21] found, in a study conducted in 2016 in 100 severe OSAHS cases, a prevalence of snoring of 93%. These results are consistent with literature evidence that snoring is a common and habitual sign in OSAHS.

The average oxygen desaturation index varied according to the severity of the OSAHS, namely 4.74, 9.10 and 19.46 for mild, moderate to severe forms. M Khalifa and Co found in 2017, during a study conducted in the pneumology department of Rabta University Hospital in Tunis, on apneic patients, during a period of 5 years, a correlation between severity of the OSAHS and desaturation. [20]

The prevalence of OSAHS was 87.62% (n = 184). Our prevalence was higher than that of Ben Ahmed and Co and Oumerzouk KS and Co respectively (79% and 74.5%) [17].

Our study found mild OSAHS in 35.86% of cases (n = 66), moderate OSAHS in 29.90% of cases (n = 55), and severe OSAHS in 34.24% (n = 63). In addition, other studies had shown a higher prevalence of severe OSAHS: Deblois and Co (63.41%) [22], Kallel and Co (51.4%) [23]. According to the nature of OSAHS, pure obstructive apnea accounted for 55.98% of patients, mixed 44.02%

of cases with clear obstructive prevalence. No pure central apnea was observed. Indeed the central OSAHS is very rare outside the context of heart failure and / or stroke. It affects approximately 9% of the general population aged 40 to 97, for a central apnea index greater than or equal to 1, and 30 to 50% of patients with heart failure.

Treatment

➢ Hygiene and dietary measures

They are a key pillar in the management of OSAHS. They begin with stopping smoking, alcohol, practicing regular sports and a balanced diet. Compliance with dietary and lifestyle measures contributes to the improvement of OSAHS but also comorbidity factors such as hypertension, obesity, dyslipidemia and diabetes, among others. The weight reduction by dietary and hygiene measures associated with bariatric surgery in four patients was found in the group with OSAHS, i.e. 16.30% of cases (n = 30).

➢ Medical treatment

In our study, the prevalence of symptomatic treatments was higher in apneic patients. Of the symptomatic treatments, anxiolytics and analgesic pallier II were prescribed in at least one in five cases. Their prevalence increased with the severity of OSAHS.

➢ Equipment treatment:

CPAP is the reference treatment for OSAHS. The principle lies in the application of a continuous positive pressure in the airways. Of the patients with OSAHS, 44.57% (n = 82) were under CPAP. Prevalence of the equipment was higher in severe OSAHS (38%). In our study, the prevalence of paired patients was significantly higher than that of Souki and Co (4.76%) [14] in 2015. In fact, the importance of the impact of the OSAHS seems to be one of the main factors that can influence the decision to initiate a specific treatment, whether cardiovascular consequences, and especially neuro-psychic manifestations integrating the severity of daytime hypersomnia. This could explain why some patients with mild SAS were under CPAP.

Evolution and monitoring

➢ Under medical treatment alone:

The evolution was favorable in 26 patients whose OSAHS was not confirmed. On the other hand, in cases with confirmed SAS (n = 105), 95 patients (90.47%) had a favorable outcome; only one case of death was noted. The Punjabi study [24] showed that in a cohort of 6,441 patients, over a follow-up period of 8.2 years, all-cause mortality was higher in subjects with severe AHI in men aged 40 to 70 years.

➢ Under CPAP treatment

Eighty-two (82) apneic patients were fitted. Unlike medical treatment alone, the equipment was more effective with the severity of OSAHS. Only one patient did not have normalization of AHI after 12 months under CPAP. Gentina and Co [25], in a prospective study of patients with severe SAS with an average baseline AHI at 49.9 / H, found a good evolution after CPAP treatment in all patients with an average control AHI at 4.3 / H. CPAP treatment not only improves quality of life but at the same time allows control of comorbidity factors.

Conclusion

OSAHS is a common condition with significant morbidity and mortality. It is a common and disabling disease clearly associated with an increase in cardiovascular morbidity. The cardiological community must screen for OSAHS in the same way as other cardiovascular risk factors. It is therefore important for any health professional to recognize the signs and symptoms of OSAHS so that the diagnosis can be confirmed and treatment can be started as soon as possible. Continuous positive airways pressure is the best treatment for this condition.

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