

Clinical and polysomnographic profile of sleep-disordered breathing patients according to the treatment indicated

Perfil clínico e polissonográfico de pacientes com transtorno respiratório obstrutivo do sono segundo o tratamento indicado

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ABSTRACT

Objective: To compare clinical and polysomnographic profiles of patients with obstructive respiratory sleep disorder according to the type of recommended treatment. **Methods:** A retrospective study of 131 patients treated at the Sleep Disorders Outpatient Clinic of Faculdade de Medicina do ABC, between August 2003 and July 2008. The indication of treatment considered both clinical and polysomnographic criteria. The patients were divided into clinical and surgical treatment groups. **Results:** Of the 131 patients, 59.5% were male and 40.5% were female with an average age of 48.9 ± 13.2 years. Clinical treatment was recommended for approximately 71.8% of the patients, and surgical treatment was recommended for approximately 28.2% with a prevalence of continuous positive airway pressure (CPAP) (60.6%). In both groups, there was male prevalence, and the average age was between forty and fifty years with no statistical significant differences between the groups. In the group receiving clinical treatment, the majority of the patients had moderate and severe obstructive sleep apneas (OSA). No statistical differences were found between the two groups in terms of clinical and polysomnographic variables. **Conclusions:** The majority of the patients were clinically treated with CPAP prevalence. However, almost one-third of the patients needed surgical intervention, with a high prevalence of anatomical abnormalities in this group. The type of recommended treatment was not influenced by clinical or polysomnographic parameters, which suggests that the presence of anatomical abnormalities in the upper respiratory tract or craniofacial region may be the main criterion for recommending surgical treatment.

Keywords: Sleep apnea, obstructive/surgery; Polysomnography; Positive-pressure respiration; Pharynx/surgery; Continuous positive airway pressure

RESUMO

Objetivo: Comparar o perfil clínico e polissonográfico em pacientes com transtorno respiratório obstrutivo do sono, segundo o tipo de tratamento indicado. **Métodos:** Estudo retrospectivo com 131 pacientes atendidos no Ambulatório de Transtornos Respiratórios do Sono da Faculdade de Medicina do ABC, entre Agosto de 2003 e

Julho de 2008. A indicação do tratamento considerou critérios clínicos e polissonográficos. Os pacientes foram divididos em dois grupos: tratamento clínico e tratamento cirúrgico. **Resultados:** Dos 131 pacientes, 59,5% eram do sexo masculino e 40,5% eram do sexo feminino, com idade média de $48,9 \pm 13,2$ anos. Cerca de 71,8% receberam indicação de tratamento clínico e 28,2% de tratamento cirúrgico, sendo a pressão positiva contínua nas vias aéreas (CPAP, do inglês *continuous positive airway pressure*) a mais indicada (60,6%). Nos dois grupos houve predomínio de homens e a faixa etária média esteve entre a quarta e quinta décadas de vida, porém sem diferença estatística entre eles. No grupo submetido a tratamento clínico, houve predomínio de pacientes com Síndrome da Apneia Obstrutiva do Sono (SAOS) moderada e grave. Não houve diferenças estatísticas entre os dois grupos em relação às variáveis clínicas e polissonográficas estudadas. **Conclusões:** A maior parte dos pacientes foi tratada clinicamente, com predomínio da CPAP. Porém, quase um terço dos pacientes necessitou de intervenção cirúrgica, mostrando a alta prevalência de alterações anatômicas nesse grupo. A indicação do tipo de tratamento não foi influenciada pelos parâmetros clínicos ou polissonográficos, mostrando que a presença de alterações anatômicas sobre a via aérea superior ou craniofaciais talvez seja o principal critério de indicação do tratamento cirúrgico.

Descritores: Apneia do sono tipo obstrutiva/cirurgia; Polissonografia; Respiração com pressão positiva; Faringe/cirurgia; Pressão positiva contínua nas vias aéreas

INTRODUCTION

Obstructive sleep apnea (OSA) is characterized by recurring episodes of partial or total obstruction of the upper respiratory tract during sleep. The resulting irregular respiratory pattern causes oxyhemoglobin desaturation and interrupted sleep⁽¹⁾.

Defined by the presence of excessive daytime sleepiness and apnea-hypopnea index (AHI) greater than 5 per hour in polysomnography (PSG), the prevalence of OSA is estimated to affect 4% of middle-aged men and 2% of middle-aged women⁽²⁾.

Study carried out at Faculdade de Medicina do ABC – FMABC, Santo André (SP), Brazil.

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Clinically, OSA is characterized by snoring, pauses in breathing, excessive daytime sleepiness, cognitive changes (deficits in concentration and memory), mood fluctuations, nocturia, gastroesophageal reflux, fatigue, morning headaches, and decreased libido⁽³⁾.

Currently, OSA is considered a public health problem because it increases the risk of systemic arterial hypertension, cardiovascular complications, road accidents, and premature death if it is not treated⁽⁴⁾.

The physiopathology of the disease is multifactorial: it involves anatomical abnormalities in the upper airway tract and craniofacial region and neuromuscular changes in the pharynx^(5,6).

Obesity is the main factor associated with OSA, since the fatty tissue is deposited around the upper respiratory tract and predisposes it to collapse⁽⁷⁾.

OSA is diagnosed through the patient's clinical history, polysomnographic readings (PSG), and the criteria established in the 2005 International Classification of Sleep Disorders (ICSD)⁽⁸⁾.

The OSA treatment must be multidisciplinary and designed to eliminate obstructive respiratory events. This will restore normal sleep patterns and adequate arterial blood oxygen levels. Clinical measures, known as sleep hygiene, are first implemented in conjunction with recommendations of weight loss, hormonal illnesses treatment, sedative substances elimination (e.g., alcohol and tranquillizing medication), lateral decubitus, topical steroids usage when necessary, and anti-reflux measures.

The treatment of choice for OSA is continuous positive airway pressure (CPAP), which has been shown to reduce symptoms of daytime sleepiness, improve airflow, and increase quality of life⁽⁹⁾. However, given the difficulty of adaptation to the side effects, the adherence to this treatment is low and ranges between 46 and 80% of users⁽⁹⁾.

Other treatments have been proposed as alternatives to CPAP, such as the mandibular advancement splint (MAS). The action mechanism of MAS is the movement of the jaw forward, which prevents the tongue from falling back over the airway. This diminishes both snoring and apnea in some patients⁽¹⁰⁾.

Surgical treatment has been proposed for the correction of anatomical changes in the pharynx, nasal passages, base of the tongue, and craniofacial region. This presents a curative intent or can be used as an adjuvant to other therapies⁽¹¹⁻¹⁶⁾.

The objective of this study was to compare the clinical and polysomnographic profiles of patients with obstructive respiratory sleep disorder following the recommended treatment.

METHODS

We performed a retrospective study with 131 patients that were treated at the Clinic of Respiratory Sleep Disorders from the Ear, Nose, and Throat Department of the Fac-

uldade de Medicina do ABC between August 2003 and July 2008. These patients had their diagnosis confirmed through clinical and polysomnographic evaluations, besides the criteria of the International Classification of Sleep Disorders⁽⁸⁾.

All patients treated at this clinic were usually subject to a service protocol that included directed anamnesis, anthropometric data, physical examination, and basal polysomnography.

The recommended therapy for each patient accounted for the anamnesis data, anthropometric profile of patients, anatomical abnormalities in the upper respiratory tract, craniofacial abnormalities, and polysomnographic parameters. All of the patients were instructed regarding general recommendations (e.g., control of obesity and associated diseases), sleep hygiene (e.g., avoiding a supine position while sleeping), and the use of alcoholic beverages and sedatives. The therapeutic options considered included both clinical and surgical measures. When clinical treatment was the only proposed treatment, options included the use of CPAP, MAS, and sleep hygiene. Surgical treatment included surgeries on the upper respiratory tract or craniofacial region.

Once the patients were distributed into groups, they underwent retrospective analysis according to the protocol data. Statistical analyses were performed using Fisher's exact test, chi-square test and Wilcoxon signed-rank test.

RESULTS

Of the 131 studied patients, 78 (59.5%) were male and 52 (40.5%) were female (Figure 1). The average age was 48.9 ± 13.2 years. Regarding treatment, 94 patients (71.8%) were recommended for clinical treatment (CT Group) and 37 (28.2%) were recommended for surgical treatment (ST Group) (Figure 2).

The CT Group was composed of 56 (59.6%) male patients and 38 (40.4%) female patients, with an average age of 52 ± 11 years (26-88 years), and an average body mass index (BMI) of 30 ± 5.8 kg/m². According to the polysomnographic results, 7 patients (7.5%) presented an AHI less than 5, 23 (24.5%) presented an AHI between 5 and 15, 25 (26.6%) presented an AHI between 15 and 30, and 39 (41.5%) presented an AHI greater than 30 (Tables 1 and 2).

The types of recommended treatment were: CPAP (60.6%), MAS (13.8%), and sleep hygiene exclusively (25.5%) (Figure 3).

The ST group was composed of 23 (62.2%) men and 14 (41.2%) women, with an average age of 39.2 ± 12 years, and an average body mass index (BMI) of 27.7 ± 4 kg/m². According to the polysomnographic results, 7 (18.9%) patients presented an AHI less than 5; 12 (29.7%) presented an AHI between 5 and 15; 8 (16.2%) presented an AHI between 15 and 30; and 10 (35.1%) presented an AHI that exceeded 30 (Tables 1 and 2).

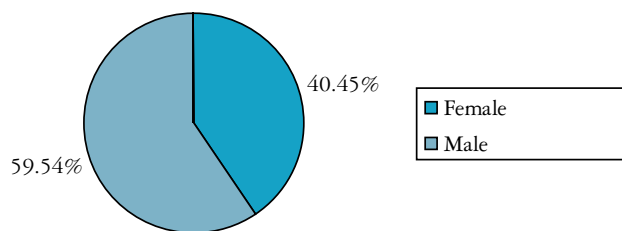


Figure 1: Distribution by gender.

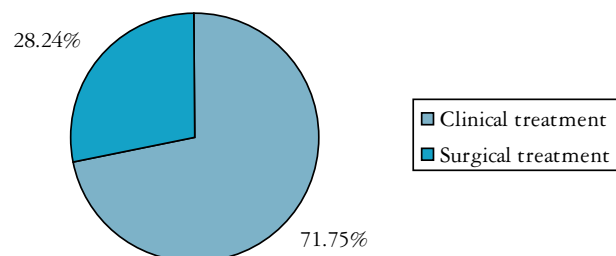


Figure 2: Distribution according to the type of treatment received.

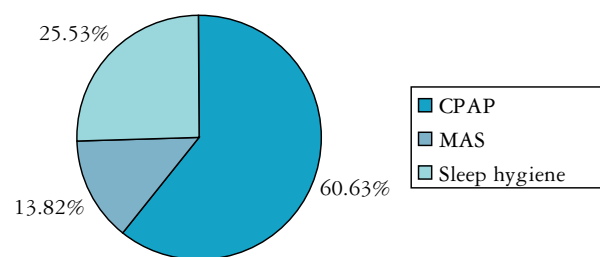


Figure 3: Types of recommended clinical treatment.

By comparing both groups of patients, no statistical significant differences were observed between the clinical and polysomnographic variables studied.

DISCUSSION

OSA is a chronic and progressive disease that causes a series of metabolic, cognitive, and cardiovascular changes, and it is currently regarded as a growing Public Health problem^(3,17). It presents a multifactorial etiology^(5,6), and several individual factors may be involved in its etiopathogenesis and severity. Thus, the treatment chosen in each case must be carefully analyzed, and the individual characteristics of each patient must be considered, including clinical factors, the presence of craniofacial abnormalities, and other aspects. Appropriate treatment is essential and fundamental to restore patient's quality of life.

The distribution of the groups, analyzed for gender, was not evident in this study, since similar percentages of men and women comprised both groups. However, the predominance of

Table 1: Apnea-hypopnea index: comparison between clinical and surgical group

AHI	Clinical group n (%)	Surgical group n (%)
< 5 (normal)	7 (7.45%)	7 (18.9%)
5-15 (mild)	23 (24.47%)	12 (29.7%)
15-30 (moderate)	25 (26.6%)	8 (16.2%)
> 30 (severe)	39 (41.49%)	10 (37.8%)

AHI: Apnea-hypopnea index; n: number of patients; p<0,05.

Table 2: Clinical data: comparison between clinical and surgical group

	Clinical group	Surgical group	p-value
Men	56 (59.6%)	23 (62.2%)	0.49
Women	38 (40.3%)	14 (41.2%)	0.49
Age	52 ± 11 years	39.2 ± 12 years	0.32
BMI	30 ± 5.8 kg/m ²	27.7 ± 4 kg/m ²	0.24

BMI: body mass index; Wilcoxon signed-ranked test.

male patients in the study coincided with findings in the literature that show a higher incidence of the disease in men^(2,18).

The patients in the current study were, on average, in their forties and fifties, which is an age range that is correlated with a greater prevalence of OSA, according to epidemiological data described in literature⁽¹⁸⁾. Although no statistical difference was observed, the CT Group was composed of older patients, while the ST group was composed of younger patients. This can be explained by the fact that surgical treatment of OSA has better outcomes in young patients⁽¹⁹⁾ because they have not yet suffered the influence of neuromuscular factors that are present in the etiology of the disease in older patients. In addition, younger patients present fewer comorbidities, such as systemic arterial hypertension, *diabetes mellitus*, and arrhythmias. These are factors that have been shown to increase surgical risks^(10,20).

Due to the fat accumulation in the cervical region, obesity plays an important role in the physiopathology of OSA^(7,21). This fact, which is also associated with obstructive anatomical factors, tends to worsen the severity of the disease. In obese patients, surgery of the upper respiratory tract alone may not be effective in treating the disease. No statistical difference was observed between groups for BMI; however, the ST group was composed of patients with a lower BMI than the other patients.

Regarding the AHI for the CT Group, the majority of the patients with moderate and severe OSA received clinical treatment. CPAP was the therapeutic option recommended for the majority of the patients in this group; it is also the treatment of choice for the disease according to literature^(20,22,23).

The objective of the surgical treatment in cases of OSA was curative in mild cases and adjuvant in severe cases⁽¹⁹⁾. Thus, nasal surgeries and tonsilectomies are equally capable of making the upper respiratory tract permeable, causing a reduction in the resistance level, and facilitating the use of

CPAP^(24,25). Therefore, one of the main factors related to the recommendation and success of OAS surgical treatment is the presence of anatomical abnormalities⁽²⁶⁾. Perhaps for this reason we did not encounter differences in the clinical and polysomnographic parameters between the two groups of patients.

Most of the patients received clinical treatment with a prevalence of CPAP, which is the main and most effective OSA treatment when adequately used. However, approximately one-third of the patients needed surgical intervention, and they displayed a high prevalence of anatomical abnormalities.

The type of recommended treatment was not influenced by the clinical or polysomnographic parameters, which showed that the presence or absence of anatomical abnormalities in the upper respiratory tract or in the craniofacial region was perhaps the main criterion for recommending a surgical OSA treatment.

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