



The relations between obstructive sleep apnea, mouth breathing and obesity with a focus on Speech Language Pathology and Audiology: a bibliographical study

A relação entre a apneia e hipopneia obstrutiva do sono, respiração oral e obesidade com enfoque no tratamento fonoaudiológico: um estudo bibliográfico

La relación entre la apnea y hipopneia obstructiva del sueño, respiración oral y obesidad con enfoque en el tratamiento fonoaudiológico: un estudio bibliográfico

Marcia Manuella Menezes Silva*

Thaíza Estrela Tavares**

Vivianne de Sá Ribeiro Pinto***

Abstract

Introduction: The Speech, through the specialty orofacial myofunction, has been growing and conquering new fields of action currently, especially on the breathing malfunctions, such as the Apnea and Hypopnea on Sleeping Obstruction Syndrome (SAHOS) as well as the Oral Breathing, caused by malfunctions and disorders of the stomatognathic structures, obesity being one of the main problems that lead to SAHOS. **Goal:** Investigate the Apnea and Hypopnea on Sleeping Obstruction Syndrome (SAHOS) as well as its relations to Oral Breathing and Obesity with emphasis on Speech and Voice

*Speech Language Pathologist and Audiologist, Undergraduate degree in Speech Language Pathology and Audiology by UNINOVAFAPI-PI, Resident Physician in the program Health of Child Multiprofessional of Mother and Child Unit – HU/UFMA, Brazil.

Speech Language Pathologist and Audiologist, Master's Degree in Health Sciences - UFPI, graduated in Orofacial Myology - UFPE, professor of Speech Language Pathology and Audiology at UNINOVAFAPI-PI, Brazil. * Speech Language Pathologist and Audiologist, Undergraduate degree in Speech Language Pathology and Audiology by UNINOVAFAPI-PI, graduated in Neurofunctional Speech Language Pathology and Audiology - FonoHosp – PI, Brazil.

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Correspondence address: Marcia Manuella Menezes Silva; Rua Duque Bacelar; Ap 102; Condomínio Athenas Park V; BL 07; Bairro: Altos do Calhau, São Luis-MA . Brasil. CEP: 65072-023.

E-mail address: marcia_manuella_@hotmail.com

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Therapy. **Methodology:** A bibliographic research was chosen over data available mainly on books and scientific papers from virtual data bases like SCIELO and LILLACS as well as the ones available in traditional libraries that has been published since 2005. **Results and Discussion:** Based on the research SAHOS is strongly connected to Oral Breathing and Obesity because of anatomic and physiologic facts. From the papers analyzed, 3 were study cases and even though they're few, all show the efficiency of the Speech Language Therapy on SAHOS's patients. **Conclusion:** Studies on the Speech and Language Therapy show its efficiency on SAHOS's patients, once it can reduce the incidence of apnea and hypopnea and, by that, reduce the gravity of the SAHOS and enhance the quality of life. Clear is the need for more studies on this field opening a new area of action for Speech and Language Therapy.

Keywords: sleep apnea, obstructive; Speech, language pathology and Audiology; obesity; mouth breathing

Resumo

Introdução: a Fonoaudiologia, através da especialidade em motricidade orofacial, vem crescendo e conquistando novos campos de atuação, com destaque no tratamento dos distúrbios respiratórios, entre eles, a Síndrome da Apneia e Hipopneia Obstrutiva do Sono (SAHOS) e Respiração Oral, devido à presença de alterações nas estruturas e funções estomatognáticas, sendo a Obesidade um dos principais fatores predisponentes para a SAHOS. **Objetivo:** investigar a Síndrome da Apneia e Hipopneia Obstrutiva do Sono e sua relação com a Respiração Oral e Obesidade, com enfoque no tratamento fonoaudiológico. **Metodologia:** trata-se de uma revisão de literatura, realizada a partir de buscas de artigos científicos encontrados no banco de dados da SCIELLO e LILLACS e livros de bibliotecas tradicionais publicados desde 2005. **Discussão:** de acordo com os dados encontrados, há evidências de que a SAHOS está fortemente relacionada à respiração oral e à obesidade devido a fatores anatômicos e funcionais. Dos trabalhos analisados, foram encontrados três estudos de casos e, apesar do número reduzido, todos apontam para a eficácia do tratamento fonoaudiológico em pacientes com SAHOS. **Conclusão:** estudos referentes à atuação fonoaudiológica mostram a eficácia do processo terapêutico em pacientes com SAHOS, uma vez que proporciona a diminuição dos eventos respiratórios de apneia e hipopneia, o que diminui a gravidade da SAHOS e melhora a qualidade de vida. Portanto, faz-se necessário a realização de mais estudos nessa área abrindo uma nova vertente para a atuação fonoaudiológica.

Palavras chave: apneia do sono tipo obstrutiva; fonoaudiologia; obesidade; respiração bucal

Resumen

Introducción: la Fonoaudiología, través de la especialidad en motricidad orofacial, viene creciendo y conquistando nuevos campos de actuación, con destaque en el tratamiento de los disturbios respiratorios, entre ellos, el síndrome de Apnea y Hipopnea Obstrutiva del Sueño (SAHOS) y respiración oral, debido a la presencia de alteraciones en las estructuras y funciones estomatognáticas, siendo la Obesidad uno de los principales factores predisponentes para el SAHOS. **Objetivo:** investigar el síndrome de Apnea e Hipopnea Obstrutiva del sueño y su relación con la respiración oral y Obesidad, con enfoque en el tratamiento fonoaudiológico. **Metodología:** una revisión de literatura, hecha por medio de artículos científicos encontrados en el banco de datos de SCIELLO y LILLACS y libros de las bibliotecas tradicionales desde el período de 2005. **Discusión:** de acuerdo con los datos encontrados, hay evidencias de que el SAHOS está fuertemente relacionado a la respiración oral y obesidad debidos a los factores anatómicos y funcionales. De los trabajos analizados, tres estudios de casos han sido encontrados y todos apuntan para la eficacia del tratamiento fonoaudiológico en pacientes con SAHOS. **Conclusión:** estudios referentes a la actuación fonoaudiológica demuestran la eficacia del proceso terapêutico en pacientes con SAHOS, una vez que proporciona la reducción de los acontecimientos respiratorios del apnea y hipopnea, que disminuye la gravedad del SAHOS y mejora la calidad de vida. Por lo tanto, hace necesario la realización más estudios, abriendo una nueva vertiente para actuación fonoaudiológica.

Palabras clave: apnea del sueño obstrutiva; fonoaudiología; obesidad; respiración por la boca

Introduction

Currently, the Speech Language Pathology and Audiology has been growing and gaining new fields of activity, with an emphasis in the treatment of respiratory disorders, among them the Obstructive Sleep Apnea-Hypopnea Syndrome (OSAHS) and oral breathing associated with obesity. Studies report the prevalence of OSAHS in obese and mouth breathing individuals; as a result, it has become crucial to investigate the relations between OSAHS, mouth breathing and obesity.

According to Soares¹, obese individuals present excess of adipose tissue in the upper airways, making it narrower and prone to collapse during sleep, which is a barrier to the air passage, favoring episodes of apnea and hypopnea during sleep.

The OSAHS is characterized by recurring episodes of upper airway obstruction during sleep, associated with clinical signs and symptoms such as: snoring, excessive daytime sleepiness and respiratory pauses defined as a stop (apnea) or reduction (hypopnea) of the passage of air².

Speech Language Pathology and Audiology, through the field of concentration of orofacial myology, acts in the prevention, assessment, diagnosis, and treatment of structural and functional aspects of the orofacial region, including upper airway, also in the treatment for oral breathing individuals. The speech-language therapy work, in these cases, through the myofunctional therapy, has been effective in adequacy of muscle tonus, mobility and posture of stomatognathic system structures, that can also be changed in Obstructive Sleep Apnea-Hypopnea Syndrome, because it favors the collapse of the upper airways^{3,4}.

Starting from this premise, a current option of treatment for OSAHS is the Speech Language Therapy. However, experiences in this area are little known by health professionals, including by Speech Language Pathologists and Audiologists.

For this reason, this study has aimed to search for, and contribute to the knowledge of the general population and health professionals, with the clarification of causes, consequences, diagnosis and treatment of Obstructive Sleep Apnea-Hypopnea Syndrome (OSAHS) and mouth breathing, associated with obesity, highlighting the relations between them and showing the Speech Language Therapy effect.

For such, a bibliographic survey was carried out in scientific articles found in the database of SCIELLO and LILACS, and books found in traditional libraries published since 2005. They used the following descriptors: apnea/hypopnea sleep, mouth breathing, obesity and speech language therapy, presenting as the main theme of study the Obstructive Sleep Apnea-Hypopnea Syndrome.

The findings were analyzed, compared and discussed, thus allowing for the formulation of important considerations on the topic discussed in this work.

Literature review

Mouth Breathing

Breathing is a vital function for the human being. Through it occur the gas exchange of the body with the external environment, through the inspiration and expiration. It is considered appropriate to perform breathing by nasal route, since the nose function is to warm, humidify and purify the inspired air before it reaches the lungs, also contributing to the maintenance of body temperature and for an adequate craniofacial development^{5,6}.

The nasal breathing depends on the integrity of the anatomical structures of the airways. Therefore, when there is any obstruction in the anterior part of the nose, pharynx or both of them, preventing the passage of air through the nasal cavity, the individual is forced to breathe through the mouth in order to maintain their vital functions, characterizing the mouth breathing^{6,7}.

The mouth breathing can be divided into two types: chronic, when it occurs on a recurring basis, both during the day and during the night; or night, when the individual performs nasal breathing during the day, but breathing by mouth⁸ during sleep.

According to Marchesan⁷ the complaints of patients who have been or still are mouth breathers are not always related to the incorrect respiratory pattern, but, especially, to its consequences by referring, for example, difficulties to perform physical activity, sleep during the day, waking up for choking during the night, in addition to halitosis and sensation of dry mouth.

According to Nouer⁹ the etiology of oral breathing may be associated with obstructive or organic factors, for instance: medication and



allergic rhinitis, nasal trauma, deviated septum, organic nasal malformations, nasal polyps, tumors in the nasal cavity, tonsils hypertrophy and pharyngeal tonsils (adenoids), while highlighting the functional factors, being: harmful oral habits, such as digital sucking and pacifier that can change the craniofacial growth, dental occlusion, in addition to causing changes in speech organs, and craniofacial malformations such as a change in the suprahyoid muscle, changes of the jaw and/or of the tongue, lips and cheeks.

This respiratory mode can bring several consequences that endanger the health of an individual, such as changes in craniofacial development and growth, predominantly vertical; occlusive changes with dental protrusion and open bite characterizing the occlusion Class II of Angel; changes of speech organs with shortened upper lip, narrow nostrils, flaccidity of the orofacial musculature and amended oral proprioception; postural changes with forward sloping shoulders; changes of oral functions such as inefficient chewing, atypical/adapted swallowing, imprecise speech and hiponasal, hyper voice, or hoarseness^{7,10}.

The mouth breathing also causes upper airway infections such as frequent sinusitis; otitis media and recurring; snoring and obstructive sleep apnea; daytime sleepiness; loss of smell and taste; hearing loss; changes in metabolism, such as loss or gain of weight and behavior disorders, such as: agitation, anxiety, impatience and discouragement, in addition to difficulties in attention and concentration and, in the case of children, causing difficulties in school^{7,11}.

Mouth breathing patients must be cared for by a multidisciplinary team, among them, the speech pathologist, skilled professional to treat respiratory disorders. For such, it is necessary to carry out the evaluation of the structures of the stomatognathic system and orofacial functions, as well as the general health conditions of the individual, and to investigate the etiology of oral breathing, upon diagnosis of an Ear-Nose-Throat⁷ (ENT) doctor.

The speech-language treatment consists, first of all, on the awareness of the patient and his family about the damage caused by oral breathing, also explaining, with regards to the functioning of the respiratory system and the importance of proper breathing. Thereafter, through the speech-language therapy, that seeks to re-establish the nasal breathing. The patient must relearn how to use the nose

by continuous training not only in therapy as well as in your home in order to obtain better results^{6,7}.

In addition, there are performed isometric and specific isotonic exercises in order to provide the adequacy of muscle tone and improve the posture of the speech organs, strengthening muscles of the lips and cheeks, elongation of upper lip filter, relaxation of the mentalis muscle, among others, thus providing that the stomatognathic functions of breathing, chewing, swallowing, speech and voice, that can be changed, work properly⁶.

Filho⁶ also underscores the importance of multidisciplinary treatment in mouth breathing patients, including the ENT doctor, pediatrician, allergist, physiotherapist and orthodontist, in order to obtain the expected success in your treatment, it is vital that each specialty professional understands about the various areas involved in the rehabilitation of these patients, acting jointly.

Obesity

Obesity is considered a public health and economic problem, since it affects men and women at any age. It is an important risk factor for cardiovascular diseases, orthopedic changes, hypertension, metabolic changes, gastroesophageal reflux disease, psychological disorders, asthma, as well as for the obstructive sleep apnea-hypopnea^{12,13,14}.

Obesity is a chronic disease characterized by the excessive accumulation of adipose tissue in the body. It is identified by means of anthropometric criteria, which is, weighing above the standard according to the height and age. In this way, the measure most commonly used to define obesity is the Body Mass Index (BMI), which corresponds to the weight (kg) divided by height in meters squared (p/h^2). It is considered normal BMI between 18.5 and 24.9 kg/m^2) and overweight between 25 to 29.9 kg/m^2). Thus, obesity is classified into: class I obesity, between 30 and 34.9 kg/m^2 ; obesity class II, 35.0 to 39.9 kg/m^2 and obesity class III, ≥ 40.0 kg/m^2), called morbid obesity^{15,16,17}. Another form of anthropometric measurement is the determination of the perimeter of the abdominal circumference, the iliac crests and outer circumference of the neck¹⁶.

According to a survey conducted in 2012 by VIGITEL (Surveillance of Risk and Protection Factors for Chronic Diseases by Telephone Survey), nearly half, i.e. 49% of the Brazilian

population are overweight. The increase in obesity reaches both the male and the female population. In 2006, 47.2% of men and 38.5% of women were overweight, while, in 2011, the proportions were to 52.6% and 44.7 %, respectively¹⁸.

According to the literature, the obesity is caused by two factors: exogenous that represents most of the majority of the cases and it is the obesity acquired through external influence on the organism and endogenous when obesity is developed from genetic factors, metabolic or endocrine¹².

The sedentary lifestyle, the intake of foods rich in fat (of animal origin), excess sweets and low fiber intake are environmental factors that contribute to the increase in obesity. In addition, genetic factors may play an important role in the development of obesity, because when there are obese in the family, the chances of the individual to develop obesity are larger^{16, 19}.

Other factors are related to endocrine abnormalities such as hypothyroidism, the polycystic ovary syndrome in women, disorders of the hypothalamus and psychological problems such as stress, anxiety and depression, since these are associated with binge eating²⁰.

The treatment of obesity involves a multidisciplinary and custom assessment, because it must be emphasized and defined in accordance with the needs of the individual. Patients who are in nutritional programs (dieting) and individualized physical activities are successful with regard to weight loss¹⁹.

There are still other methods of treatment, including medication, through the use of sweeteners (orlistat and sibutramine), which helps to reduce the daily energy intake; surgical and may be restrictive (with the reduction of the quantity of food that the patient eat at meals, due to construction in the stomach), malabsorption (the patient may eat normally, but the absorption of nutrients in the intestine is hampered by the withdrawal of the duodenum and jejunum) or mixed (where the two surgeries above are joined); in addition, there is the psychological treatment, which considers the behavioral factor (emotional) of the patient^{15, 20}.

Obstructive Sleep Apnea-Hypopnea Syndrome (OSAHS)

The Obstructive Sleep Apnea-Hypopnea Syndrome (OSAHS) is a change in the normal

patterns of breathing during sleep, characterized by an obstruction of the upper airway that can cause the airflow to decrease (hypopnea) or totally stop (apnea) for a period greater than or equal to 10 seconds²¹.

The snoring is the most evident symptom of OSAHS. It occurs during the period of greatest muscle relaxation during the stage of deeper sleep, i.e. during REM sleep (Rapid Eye Movement), defined as the unsynchronized sleep or paradoxical with rapid eye movement, which usually occurs after 90 minutes of sleep onset. This relaxation generates an upper airway obstruction, hindering the airflow that can cause respiratory pauses. The same occurs with mouth breathing individuals, which have obstructive apnea^{1,21} in the most serious cases.

The respiratory events are usually accompanied by oxygen desaturation and interrupted by recurring awakenings, since the sleep fragmentation is due to the obstruction of the upper airways. This favors the poor quality of sleep and behavioral changes such as sleepiness, fatigue and irritation, as well as heart and lung problems, it may even lead to sudden death²².

The excess weight affects the breathing as a result of changes in the structure and function of the upper airways and due to other anatomical mechanisms. Obesity is very common in individuals with OSAHS and most of them have a distribution of adipose tissue centrally located¹⁶.

On the other hand, the male is more affected by anatomical differences of upper airway, hormonal profile and central type fat distribution in the region of the trunk and neck. For this reason, it is assumed, in hypothesis, that excess weight affects the breathing mainly by excess adipose tissue in the region of the neck, making the pharynx small and circular^{1, 2, 16}.

With regard to diagnosis, this is based on the characterization of OSAHS by means of a clinical assessment, physical examination, and polysomnography in the sleep laboratory, which is the monitoring of sleep during the night, allowing the assessment of several basic physiological parameters, such as: electroencephalogram, electromyogram, airflow, respiratory effort, electrocardiogram, oximetry, in order to characterize the quality of sleep. The full polysomnographic study is the more detailed way to diagnose obstructive sleep apnea-hypopnea^{1, 2, 16, 21}.

From the polysomnography and other factors such as the intensity of the symptoms and the presence of cardiovascular risk, you can determine the level of severity of OSAHS: mild OSAHS, associated with mild excessive sleepiness and low rate of apnea/hypopnea (between 5 and 20 events per hour); moderate OSAHS, associated with moderate excessive sleepiness, moderate apnea/hypopnea rate (between 20 and 40 events/hour) and cardiac arrhythmias; severe OSAHS, associated with intense excessive sleepiness, high apnea/hypopnea rate (above 40 events per hour) and serious cardiac arrhythmias serious²³.

The treatment of OSAHS has the objective to implement measures to prevent the collapse of the upper airways. In this way, it is presented as a method for the treatment of obstructive sleep apnea-hypopnea syndrome, weight reduction in obese; the non-use of alcoholic drinks and sedatives; change the position of the body during sleep, causing the person sleep in lateral decubitus; avoid food abundance in the evening and the use of Intraoral appliances²⁴.

Another method widely employed in the treatment of OSAHS is the continuous positive airway pressure (CPAP), a mask used during the night that keeps the inspiratory pressure positive that causes the unblocking of the pharynx and prevents its collapse during sleep, improving its quality, which decreases the daytime sleepiness and makes the levels of severity of OSAHS stable in moderate and severe apnea².

However, many patients do not fit the CPAP due to chest discomfort and annoyance with the noise, in addition to other symptoms such as rhinorrhea, nasal congestion, oral and nasal dryness, eye irritation, skin lesion, claustrophobia and difficulties to expiration²⁴.

According to Bittencourt² there are, still, surgical treatments, such as tracheotomy, glossectomy, adenotonsillectomy, conventional and laser uvulopalatopharyngoplasty, radiofrequency and maxillomandibular advancement.

The speech-language treatment in patients with obstructive sleep apnea-hypopnea syndrome has as objective to evaluate the structures involved in the act of breathing and, above all, in myofunctional therapy with adequacy of posture, awareness and proprioception, the tonus and mobility of oral structures, pharyngeal and laryngeal through functional exercises^{24, 25}.

According to Guimarães²⁴ the speech-language evaluation should be carried out through observation, palpation of muscles and viewing of mobility and functionality of all of the upper airways muscles.

In the evaluation of the orofacial structures of the stomatognathic system, it is suggested to visualize the lips at rest; observation of marks, height, thickness and frenulum of the tongue; note the development of palatoglossal arc and mobility of cheeks; the presence of marks, edema, in addition to width and length of the uvula; to execute palpation to observe muscle strength and mass of masseter, media pterygoid, buccinator and orbicularis oris muscles. It is also necessary, to assess the stomatognathic functions of mastication, swallowing, suction and breathing that are directly related to the upper airways^{1, 24}.

It can be observed an increase in height of lingual musculature, flaccidity of palatoglossal arc visualizing the elongation of the soft palate and uvula, flaccid musculature of the facial movements, increased tongue volume, change in the position of the hyoid bone, changes in chewing, being predominantly unilateral and altered swallowing with the pressing of perioral muscles²⁴.

The myofunctional therapy in patients with obstructive sleep apnea-hypopnea syndrome uses myofunctional isometric and isotonic exercises, i.e. for tonicity and mobility, in the regions of the soft palate, in order to promote the elevation of the soft palate, uvula and the palatoglossal arc musculature with the purpose of opening space between the palate and the tongue; in the region of the face, involving the orbicularis oris muscle, buccinator, zygomaticus major and minor muscles, elevator muscle of the upper lip and the angle of the mouth and medial and lateral pterygoid through facial mimicry; and, in the tongue aiming to recruit and contract the genioglossus, hyoglossus, styloglossus, upper and lower longitudinal, palatoglossus and suprahyoid muscles²⁴.

Landa and Suzuki²⁶ and Guimaraes²⁴ also highlight the importance of the adequacy of orofacial functions of mastication, swallowing, sucking and breathing that can be changed, and exercises for cervical relaxation and speech organs.

Discussion

Physiologically, proper breathing should be performed by nasal mode and in the literature there is no disagreement about this. Marchesan⁶ and Krakauer¹⁰ stand out as the main causes of mouth breathing, nasal obstruction in hypertrophic adenoids, rhinitis, sinusitis, and septum deviation that can cause hypotonia of orofacial musculature, changes of the stomatognathic function (chewing, swallowing, suction, breathing and speech), daytime sleepiness, snoring and obstructive sleep apnea-Hypopnea Syndrome as confirms the study carried out by Izu¹¹.

The evaluation of mouth breathing is performed through the observation of the structures of the stomatognathic system and orofacial functions, the general health conditions of the individual and the investigation of the etiology of mouth breathing⁷, being of great significance the follow-up by a multidisciplinary team, not performing therapies isolated, but with common goals for a better prognosis, including medical professionals, speech pathologist and orthodontist, as highlighted by Filho⁶ and Nouer⁹.

In the literature, we can find consensus, also, in terms of the speech-language treatment which consists in raising the awareness of the patient on the damage caused by oral breathing and restoring the nasal breathing, adapting muscle tone, posture, speech organs and the stomatognathic system functions.

Tangerina¹⁷ and Rocha¹⁵ agree to say that obesity is a disease, although Figueiredo²⁰ consider it to be a syndrome. It is noted that the prevalence of obesity has increased dramatically in recent years. For this reason, Tangerina¹⁷ says that obesity is taking pandemic proportions, while Rocha¹⁵ considers it as an epidemic. The surveyed authors agree in saying that genetic factors may contribute to the development of obesity.

As regards the definition of Obstructive Sleep Apnea-Hypopnea Syndrome, there is a consensus among the authors that this syndrome is characterized by the reduction or a total impairment of airflow through an obstruction of the upper airways during sleep.

According to Soares¹ the intense snoring is one of the main symptoms of Obstructive Sleep Apnea-Hypopnea Syndrome. However, Tangerina¹⁷

says that we should not consider it as an indicator of OSAHS in isolation.

Some authors such as Knorst, Souza and Martinez²⁷ and Martins, Tufik and Moura²⁸ describe that OSAHS is more common in male individuals, being associated with anatomical difference existing among men and women in the upper airways, but studies show that there is an increase in the prevalence of OSAHS in women with age, due to the influence of hormones, especially with the proximity of menopause, observing, also, a high percentage of mouth breathing children as confirmed Izu¹¹ and Rosa²⁵.

The diagnosis of Obstructive Sleep Apnea-Hypopnea Syndrome is possible by means of a clinical evaluation, the polysomnography and the physical examination as highlights Bittencourt², but there are still many undiagnosed cases, mainly in children and due to the high cost of polysomnography¹¹.

In another study, Bittencourt² describes several treatments for Obstructive Sleep Apnea-Hypopnea Syndrome, among them the use of the CPAP (Continuous Positive Airway pressure), and this is the treatment most often used in these cases, as confirms Soares¹. However, Guimaraes²⁴ and Pereira¹⁶ stand out disadvantages of this method due to some maladjustment of CPAP by individuals with OSAHS.

Bittencourt², Landa and Suzuki²⁶ say that obesity causes changes in size and shape of the upper airways favoring the collapse during sleep, although Daltro²⁹ states it is not clear that the changed format of the pharynx in obese patients is associated with OSAHS.

Knorst, Souza and Martinez²⁷ report that the higher the BMI, the greater the frequency and the severity of OSAHS. However, according to a study carried out by Tangerina¹⁷, there is no significant relationship between BMI and greater severity of OSAHS, being the cervical circumference the most relevant factor to determine the severity.

All authors who relate OSAHS to obesity state that obese individuals typically present intense snoring, daytime sleepiness, respiratory pauses and fragmented sleep. The same situation is found in mouth breathing individuals, as highlighted by Marchesan⁷ and Izu¹¹.

Silva, Aureliano and Motta²¹ related the etiology of oral breathing to nasal obstruction and

the hypotonia of orofacial musculature, factors that may cause obstruction of the upper airways, thus favoring, apnea and/or obstructive hypopnea during sleep.

According to Landa, Suzuki²⁶ and Soares¹ the speech therapy through the myofunctional therapy in patients with OSAHS as well as in mouth breathers, consists, first, in being aware of the problem, in the improvement of the body posture and the performance of the basic exercises (isometric and isotonic) to improve the mobility and strength of the muscles of the stomatognathic system, as well as confirm Guimarães²⁴ and Pitta³⁰ in their studies, with emphasis on posterior muscles of the tongue and the velopharyngeal sphincter, states Rosa²⁵.

Guimarães²⁴ conducted a survey on the effects of oropharyngeal exercises in patients of both sexes, ages between 25 and 65 years with moderate OSAHS, comprising a group of 20 subjects. We observed a decrease in AHI (Apnea-Hypopnea Index), consequently, in the severity of OSAHS, in the intensity of snoring, reduced snoring and improved sleep quality, during 3 months of speech therapy.

Silva, Aureliano and Motta²¹ describe a case report of a 60 years patient, with a diagnosis of severe OSAHS, submitted to the speech-language treatment for 3 months, after that it was observed reduction of snoring, absence of daytime sleepiness and an improvement of 93% in the number of respiratory arrests.

Pitta³⁰ in another study with two patients of both genders, aging 37 and 55, with severe OSAHS, during 4 months of speech therapy, we observed a decrease in the severity of OSAHS and their symptoms, and consequent improvement of life quality. For such, the speech therapy was based on the suitability of the changes found in each patient, such as: hypotonia of orofacial musculature and reduced mobility of speech organs, cervical tension, unilateral mastication, incoordination of all vocal tract and respiratory laryngeal musculature and inadequate body posture.

It is worth pointing out that in the cases described above, all patients were instructed to use the CPAP, however all of them had difficulties adapting, because of discomfort while sleeping and fussing with the noise, in addition to its high cost^{21, 24, 30}.

As said by Pitta³⁰ and Silva, Aureliano and Motta²¹ the oral myofunctional therapy may

represent an alternative in the treatment of patients with severe OSAHS who have not adapted to the CPAP. Guimarães²⁴ highlights satisfactory results with the speech-language treatment in OSAHS in all of its severity levels in a short space of time, and the patient was advised to keep the oropharyngeal exercises learned, even after the speech therapy release.

In view of the foregoing, it can be seen that the obesity as one of the main risk factors for the prevalence of OSAHS and that the practice of speech-language pathology already scientifically proven with regard to oral breathing, has contributed in a satisfactory way for the development of studies in these individuals, providing the development of conditions of speech organs, decrease in episodes of snoring/sleep apnea and consequent improvement in quality of life.

Conclusion

During the research, it was observed that the Obstructive Sleep Apnea-Hypopnea Syndrome is closely related to Oral Breathing and Obesity, and should these factors be taken into account in the prognosis of treatment of OSAHS.

It is important to note that the literature on this topic is still scarce and few scientific publications were found. However, the existing work shows the effectiveness of the speech-language treatment in patients with OSAHS. Therefore, it is necessary to perform further studies in this area, opening a new strand of speech-language intervention in orofacial myology.

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