

SNORING – THE ROLE OF THE LARYNGOLOGIST IN DIAGNOSING AND TREATING ITS CAUSES

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Abstract

According to various data, snoring may affect about 2 billion people worldwide, with about 8 million adult people in Poland being estimated to snore. Apart from being disturbing for other people, it brings about a measurable risk for the patient, which results from transient anoxia. As a consequence, it may increase the risk of arterial hypertension, myocardial infarction, cerebral stroke and impotency, as well as mental disturbances like depression or anxiety states. The physician a snoring patient may consult in the first instance is the laryngologist. He determines whether upper airway obturation (in contrast to central sleep apnea) is dealt with, and takes a decision about treatment method, or redirects the patient to another specialist. In this paper, the position of a laryngologist in the diagnosis and treatment of snoring is presented. The material consisted of patients presenting with this problem at the otolaryngology department. The proceedings with patients in the admission office setting were described as well as qualification methods for further medical and operative treatment. A review of the applied procedures was made, in particular allowing for the most recent therapeutic methods.

Key words: diagnosis, otolaryngologist, snoring, treatment

INTRODUCTION

Snoring is a very common phenomenon. It is estimated that at least 30% of the adult population snore. This problem increases with age, and over the age of 60 it affects over 50% of people, including about 60% of males and 40% of females [1, 2]. Among them, 30 to 50% suffer from obstructive sleep apnea syndrome or upper airway resistance syndrome, which significantly increases the risk of arterial hypertension, myocardial infarction, cerebral stroke, depression and anxiety disorders, or impotency disorders [3]. Snoring without apnoea may cause sleepiness during the daytime, morning sore throat and uvular swelling, mouth dryness or choking sensations. No less important is also its social aspect, since snoring disturbs the person sharing a bed, room or compartment with the snorer, frequently leading to a conflict [4]. The snoring problem also affects approximately 6% of children, of which almost 25% manifest coexisting apnea attacks

[1]. As a result, the child can have impaired concentration and memory, and show hyperexcitability or even retarded intellectual development. It may also have an influence on failure in the orthodontic treatment of small patients.

The snoring phenomenon is related to disturbances in the movement of inspired air, which leads to the development of turbulence and actuates palatovular vibrations. Difficulties in the flow of air through airways are most frequently induced by a blockage being present within them. The most frequent reasons for its presence there are as follows: airway wall swelling (allergy, GERD); adenoid tissue hypertrophy; hypertrophy, deformations, disorders within osseous membranous or muscular structures; adipose tissue pressure on throat (obesity: BMI >27, collar size >35 cm); disorders of mastication apparatus (including genetic defects); endocrinological diseases (acromegaly, hypothyroidism). Sleep abnormalities being related to disturbed breathing are classified as: snoring, upper airway resistance syndrome (UARS), obstructive sleep apnoea, obesity hypoventilation syndrome.

The term snoring is used to describe an acoustic phenomenon during sleep, developing as a result of vibrations of some structures within the respiratory system. They can thus be treated as a vocalization of the presence of obstruction within airways. Upper airway resistance syndrome is characterized by recurring snoring attacks with increasing intensity (crescendo snoring), interrupted by awakenings, during which the flow of air through the upper airways returns temporarily to a normal condition. This syndrome occurs more frequently in women suffering from anxiety states. In anamnesis, patients frequently report an accompanying sensation of sleepiness and fatigue during daytime. Apnea is a term used for recurring suspension of breathing during sleep, lasting longer than 10 s. The degree of sleep apnoea is described by the number of episodes per hour of sleep: normal <5; I - mild 5-15; II - moderate 16-30; and III - severe >30. The diagnosis of snoring should usually start with a medical interview, during which the patient should be asked about morning discomfort, such as sore throat, headaches, fatigue and sleepiness sensations, as well as acid eructation or heartburn (pyrosis). It is also beneficial to ask a person sharing the sleeping-room with the patient some questions. In laryngological examination, a careful evaluation of the nasal, nasopharyn-

geal and pharyngeal cavities is particularly important. The soft palate with arcs and the uvula, its dimensions and the presence of a rugged surface (rugged uvula) should be carefully examined, and the size of the palatine tonsils should also be determined. The area of the tongue base, epiglottis, and oesophageal stoma is also important. Evaluation is made easier owing to the application of endoscopic techniques. Undoubtedly, the most valuable examination technique is polysomnography, but it is still not widely available and it is expensive. In selected cases, rentgenographic examinations are also useful, such as computer-assisted tomography, cephalometry, and magnetic resonance imaging [5].

The treatment of breathing disorders during sleep includes non-operative methods, such as: reduction of body weight through appropriate diet and physical exercise; sleep hygiene, i.e., change of body position (not supine), or the avoidance of alcoholic, soporific or anxiolytic consumption in the evening. Good effects are obtained in many cases by the mechanical restoration of upper airway patency by means of orthodontic prostheses, preventing the tongue falling back and causing a forward movement of the mandible, and the application of nasopharyngeal tubes, the efficiency of which is determined at up to 70%. One basic non-invasive method of treatment is to use CPAP apparatus [6, 7, 8]. Operative treatment includes a surgical procedure aimed at a reduction in body weight, giving excellent results in patients with high BMI [8, 9]. Operative laryngological treatment consists in the correction of all the causes of impaired patency of the upper airways [10].

MATERIAL AND METHODS

The study material consisted of patients treated at the Otolaryngology Department, Independent Public Provincial Hospital in Szczecin, in 2007- 2009. In these subjects, snoring and accompanying sleep disorders were the main complaint, or coexisted with such symptoms as difficulty in nasal breathing, general fatigue, headaches and chronic sore throat. From among them, cases qualifying for operative treatment aiming at the restoration of normal air passage through airways were singled out. Also, children with adenoid tissue hypertrophy manifested first of all in snoring and sleep apnoea were incorporated into the group under analysis. The study objective was to show the superior role of the laryngologist in the diagnosis and treatment of snoring. With this end in mind, the laryngological causes of sleep disorders were analyzed. The procedure with patients under admission room conditions was presented, as well as diagnostic procedures and qualification methods for further medical and operative treatment. The types of applied operative procedures were discussed, allowing in particular for the most recent therapeutic methods, and a partial evaluation of treatment effects was made.

RESULTS

ADMISSION ROOM MANAGEMENT

Patients reporting snoring as one of the primary symptoms constituted about 7% of all reporting per-

sons. Some of them were sent by laryngologists who had earlier diagnosed and excluded non-laryngological causes of breathing disorders during sleep. After completing the anamnesis and physical examination, during which the cause of upper airway obturation was successfully established, patients were qualified for operation and the operation date was determined. In some cases, rentgenographic examinations were carried out, most frequently to evaluate the condition of paranasal sinuses. Persons sent by primary health care physicians usually required additional examinations and consultations from such specialists as allergologists, pulmonologists, gastrologists, cardiologists, or stomatologists. In some doubtful cases, polysomnographic examination was recommended. Cases with excessive body weight constituted a particular problem. They were made aware of the effect of additional weight on the snoring phenomenon and the potential lack of improvement after surgical treatment. They were recommended to reduce body weight as the first stage of snoring control. This referred in particular to patients with a BMI over 30 [8, 9]. In pharmacotherapy, antihistamine drugs and nasal steroids were recommended, as well as a change in habits (sleep position or alcohol avoidance) [10].

OPERATIVE MANAGEMENT

Impairment of the patency of airways, leading to snoring, may take place on various levels.

I.

Within the nose or the nasopharynx, obturation is caused by: deviation of the nasal septum, hypertrophy of the inferior or middle turbinates, proliferative changes within the nasal and nasopharyngeal cavities (polyps, benign and malignant tumours), or hypertrophy of the nasopharyngeal lymphatic system. Correction of the aforesaid states is therefore the first stage of operative treatment [10].

Septoplasty as a corrective treatment of the nasal septum, in the osseous and/or cartilaginous part or its lateral deviation, is one of the most frequently followed procedures. Mucotomy, aimed at a reduction of the volume of nasal turbinates, most frequently inferior and/or middle ones, is performed as often. At present, invasive tissue volume reduction procedures are more and more frequently abandoned in favour of modern bipolar tissue stimulation techniques using radiofrequency energy [11]. In the local otolaryngology department, apparatus of the RaVoR type (Radiofrequency Tissue Volumetric Reduction) has been used for several months. The substance of this procedure consists in introduction into changed tissues (most frequently excessively hypertrophied) a special bipolar electrode that induces impulse generation and directly warms up adjacent structures to several dozen degrees. As a result of this, submucosal fibrous changes develop in the insertion site area within several weeks, and thereby a reduction of hypertrophied tissues occurs [11]. Treatment with the application of this apparatus is practically painless and is performed with local anaesthesia. The bleeding during procedure is negligible (in the insertion site) and spontaneously disap-

appears after a while. Principal indications for the procedure described above are the treatment of soft palate hypertrophy and nasal turbinate and tonsillar hypertrophy. In practice, this procedure is most frequently applied in the treatment of snoring induced by the hypertrophy of structures mentioned previously. The full effect of treatment is obtained about 6 weeks after its execution. In case of advanced changes, it is necessary to carry out a series of 2-3 treatments in several-week intervals. Furthermore, adenotomy is performed within this floor of airways, i.e. removal of the pharyngeal tonsil. This primarily refers to the youngest patients. The symptomatology of adenoid hypertrophy is very abundant. Frequently, the symptoms of exudative otitis with amblyocousia occur, and then the treatment is accompanied by myringotomy. These cases were omitted in the study, and our attention was focused only on those in which snoring with sleep apnoea prevailed.

II.

The oral part of the pharynx is the site of the next stage of snoring and obstructive sleep apnoea treatment. Responsibility for their development can be attributed to: excessive elongation of the palate and/or the uvula, hypertrophy of the palatine tonsils, and hypertrophy of the oropharynx mucous membrane. The most frequently performed procedure is uvulopalatopharyngoplasty (UPPP) [12, 13]. An alternative to this procedure is, however, the submucosal reduction of soft tissues with the use of the previously described RaVoR method. One efficient procedure of airway patency restoration within the oropharynx can be tonsillectomy, but only in well-reasoned situations (simple hypertrophy).

III.

At the floor of the laryngopharynx, the problem can be: retrognathia with tongue dislocation, hypertrophy

of the tongue and/or the lingual tonsil, and mucous membrane excess over the epiglottis. Tongue reduction surgeries are carried out in particularly severe cases [14, 15]. They have not been performed in the Provincial Hospital.

DISCUSSION

Based on the authors' own observations, as well as in the opinion of other authors, the best results in the treatment of snoring and other sleep disorders are obtained in patients in whom airway obturation causes refer to the first level, i.e., are found within the nose and the nasopharynx. Unblocking of this anatomical region brings about measurable benefits in the prevention and treatment of other, already existing laryngological diseases, such as chronic sinusitis or chronic pharyngitis and laryngitis.

Very often, the corrective treatment is a complex undertaking, e.g., septoplasty with mucotomy or submucosal turbinate and/or soft palate ablation, frequently with tonsillectomy. Careful evaluation of changes, and then complex analysis of their effects on blockage development within airways, is thus of fundamental importance for the determination of the sequence of performed actions [15]. In children, adenoids are routinely removed at the first stage, aiming at saving the palatine tonsils. Some health care facilities tend only to reduce them through trimming, i.e., tonsillotomy. In our material, the best results with respect to the eradication of sleep disorders were obtained after the application of adenotonsillectomy.

Many laryngologists observe that nasal patency restoration treatments, connected with UPPP or not, more strongly affect snoring intensity reduction than other sleep disorders [11, 12, 13 14]. This, therefore, means improvement in the quality of life, both of the patient and the persons affected by his/her snoring. Based on our observations, it is hard to explicitly con-

Table 1. List of airway patency improving treatments (Records from the Department of the Independent Public Provincial Hospital in Szczecin, Poland from 2007-2009).

Type of treatment	Males (average age)	Females (average age)	Total waning of snoring	Partial waning of snoring	No information
Septoplasty	76 (39.4)	23 (42.6)	23	19	57
Mucotomy	22 (34.3)	8 (28.7)	10	9	11
Septoplasty with mucotomy	37 (28.4)	21 (27.1)	21	10	27
Polypectomy	39 (51.3)	13 (26.2)	16	10	26
Removal of nasal cavity synechia	12 (28.1)	2 (32)	5	5	4
UPPP	4 (51.2)	---	---	4	---
RaVoR-mucotomy (1)	4 (21.4)	3 (36.3)	2	5	---
RaVoR-UPPP (2)	4 (43.8)	---	---	4	---
RaVoR 1+2	2 (52.5)	1 (58)	---	3	---
Tonsillectomy	11 (19.2)	7 (5.8)	10	5	---
RaVoR 1 + septoplasty	3 (38.0)	---	1	2	---
RaVoR 2 + tonsillectomy	1 (43.0)	---	---	1	---
Adenotomy	31 (4.8)	20 (4.1)	---	---	51
Adenotonsillectomy	19 (5.5)	18 (5.8)	14	5	16

cur with that statement. Patients are not controlled very often after treatment. Exceptions are those who report to collect histological examination results or attend for some other treatment. It is different with treatments using RaVoR since, as assumed, they must be repeated [11, 14]. The physician can, therefore, observe changes within corrected tissues and decide about further treatment. Preliminary analysis of the efficiency of this technique justifies the opinion that it is a very efficient method. It is highly evaluated by patients, who emphasise its low invasiveness and short hospitalisation time. The group of treated subjects is, however, small and non-representative.

A slow progression of changes and a relatively young age of patients are extremely important for the efficiency of snoring therapy [10, 14]. In this connection, the importance of early diagnosis and treatment of mild or moderate stages of sleep disorders in as optimal a way as possible should be stressed. One should not forget that supplementary, systematic pharmacological treatment (with antihistamines) and the preservation of proper body weight is very important in many cases after carrying out surgical procedure [10, 14]. The role of the laryngologist in the diagnosis and treatment of snoring is unquestionable. Early diagnosis, proper qualification and prompt professional action give the best therapeutic results and can protect patients from more serious health problems.

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