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Original Article

Oral Physical Findings in Patients with Chronic Nasal Obstruction

Shahin Abdollahi Fakhim[1], Nikzad Shahidi[1]*, Elnaz Hasanzadeh[2]

[1]*Department of Otolaryngology,Tabriz University of Medical Sciences,Tabriz,Iran*
[2]*Student of Medicine, Tabriz University of Medical Sciences,Tabriz,Iran*

Corresponding Author: Nikzad Shahidi, E-mail: nikzadsh@yahoo.com

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ABSTRACT

Background: Although chronic nasal obstruction causes mouth breathing, it causes changes in orofacial anatomy to compensate reduced airflow and facilitate breathing. As a result there is a mismatch between growth and evolution of orofacial structures.The aim of this study is to find oral physical findings in patients with chronic nasal obstruction. **Methods:** All patients referred to the clinic and ward in Imam Reza Hospital during 2019-2020, who suffered from chronic nasal obstruction, were examined and the findings of the examination included Tonsil size, tongue size, mallampati, tonsillar pillars size, palate height, palate thickness, ovula length, hypertrophy of nasal turbines,septal deviation, long face, neck circumference were compared among case and control groups.And also STOP-BANG score was calculated and risk of OSAS was shown. **Results:** In this study, the average age of people with nasal obstruction was 42.89±14.30. In physical examinations of the mouth, the size of the tonsils and the size of the neck did not differ significantly between two groups, but other positive examinations were significantly higher in patients with chronic nasal obstruction and there was no significant difference in blood pressure, diabetes, hypercholesterolemia, IHD, fatty liver in the control group. Only patients with nasal obstruction complained significantly more than the control group of hearing loss. **Conclusion:** The frequency of tongue enlargement, soft palate, and thick palate and Malapmati score were significantly higher in people with chronic nasal obstruction.

INTRODUCTION

Chronic nasal obstruction is one of the most peresenting complaint to clinics.(1) It can be caused by some factors including anatomic and pathophysiologic conditions such as; septal deviation, hypertrophy of turbinate or adenoid which are structures in oral cavity.(2)

Nasal cavity has a significant role in breathing process. It humidify, warm and filter inspired air. Every upper airway obstructive factor causes nasal breathing to be replaced by mouth breathing.(3) In stages of life that craniofacial development happens, open mouth breathing can cause changies in these structures setting and disarrangement of balance between teeth, bones and soft tissues.(4)Healthy people often breathe by nasal airway during the sleep and only 0-4% of sleeping time allocate to oral breathing.(5)and when obstruction of nasal airway happens,it results in hypoxia, arousals from sleep and obstructive sleep apnea. OSA's prevalence is approximately 3-9% among women and 10-17% among men 30-70 years of age.(6)And among persian people it was reported 44%.(7)

When this kind of disorders are left without any treatment, cardiovascular, cerebrovascular, methabolic and complications may happen.(8) And it also affects individual and professional function of person, so quality of life changes.(9)

Some studies showed association among comorbidities and OSA and it can be called as a risk factor of chronic organ damage.(10) MEI LAM et al(11) reported that OSA and methabolic syndrome have close connection with each other. but also Erdim et al(12) concluded that there is no association between OSA and MS.

Sapmaz et al(13) have studied CT scans of patients in turkey and coudn't find significant connection between nasal obstruction and volume of maxillary sinuses.Uchimn Koecklin et al(14)reported that unilateral nasal obstrucrtion may affect development of craniofacial complex.

The purpose of this study was to determine oral physical findings in patients with chronic nasal obstruction in otolaryngology ward at a tertiary medical center.

METHODS AND MATERIALS

A descriptive cross-sectional study records of individuals who were refered to imam reza hospital with chronic nasal obstruction between 2019 and 2020 was performed.

Sampling was done randomly. Seventy patients who were diagnosed as chronic nasal obstruction with age>18 years were called case group and seventy subjects who didn't have

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chronic nasalobstruction with age>18 years were retrieved as a control group.

Age<18 years and individuals dissatisfaction with particpating in the study were excluded.

Data was collected by a questionnaire including STOP-BANG standard questionnaire for obstructive sleep apnea and physical findings through an examination.

STOP-BANG questionnaire was first created in 2008. It includes four subjective items (STOP: Snoring, Tiredness, Observed apnea and high blood Pressure) and four demographics items (Bang: BMI, age, neck circumference, gender) (15,16,17,18)

Patients who gave three or more positive answers to the STOP-BANG questionnaire were considered at moderate or high risk of being affected by OSAS.

Also history of hypertension,cardiovascular diseases, stroke, diabetes, obesity, fatty liver and physical examination findings such as greatness of tongue, large tonsils, grade of palatine tonsils, mallampati score, long uvula, redundant soft palate, septal deviation,inferior turbinate hypertrophia, nasal polyposis were determined in both case and control groups.

All of those data were collected then examined by descriptive statistical methods and SPSS-16 statistical software.

RESULTS

One hundred fortypatients; seventy patients with chronic nasal obstruction and seventy individuals in control group were indluded in this study.

Mean age in case group was 42.89±14.30 who were elder than control group. Most of the patients with this complaint were male. The mean BMI of case group was 25.54±4.86 which didn't have significant difference in compare with control group.(Table-1)

In this study there was no significant difference between case and control group about hypertention, ischemic heart diseases,hyperchlosterolemia, diabetes and fatty liver (p value>0.2) only hearing loss in case group 16(22.85%) and in control group 3(4.28%) was notable(p value=0.02). The characteristics of the study groups according to the comorbidities shown in Table 2.

In this study frequency of sleep apnea(28.5%) and snoring(60%) in case group was significantly higher than control group(p value<0.001) (Table-3)

About oral physical examination all of the findings were more higher in case group except neck circumference and greatness of other tonsils.(p value<0.002) (Table-4)

Table 5 shows STOP-BANG scores. 28.6% in low, 50% in intermediate and 21.4% were in high risk of OSAS.

At least Chart 1 shows causes of chronic nasal obstruction obstruction which nasal polyposis and septal deviation were most prevalent among others.

Table 1. The characteristics of the patients in case and control groups

Variables		Case group	Control group	P-value
Age		42.89 ± 14.30	32.42 ± 14.89	0.00
Gender	Female	33 (47.15%)	51 (72.85%)	0.02
	Male	37 (52.85%)	19 (27.15%)	
BMI		25.54 ± 4.86	24.39 ± 7.95	0.30

Table 2. Comorbidities in case and control groups

	Variable	Control	Case	P-value
Hypertension	Yes	7	11	0.45
	No	63	59	
Hypercholesterolemia	Yes	6	6	1
	No	64	64	
Diabetes	Yes	4	7	0.53
	No	66	63	
IHD	Yes	3	2	0.78
	No	67	68	
Fatty liver	Yes	3	1	0.62
	No	67	69	
Hearing loss	Yes	3	16	0.002
	No	67	54	
Tinnitus	Yes	4	9	0.24
	No	66	61	

Table 3. Probable complications of chronic nasal obstruction

Complications		Case	Control	P-value
Sleep apnea	Yes	20	1	0.00
	No	50	69	
Depression	Yes	13	8	0.34
	No	57	62	
Anxiety	Yes	23	31	0.22
	No	47	39	
Reduced function	Yes	19	12	0.22
	No	51	58	
Restless leg	Yes	8	10	0.80
	No	62	60	
Memory loss	Yes	22	18	0.57
	No	48	52	
Snoring	Yes	42	4	0.00
	No	28	66	

DISSCUSION

In this study, meaningful correlation was found between hearing loss and chronic nasal obstruction and patients with nasal obstruction were suffered from hearing loss more than others. A population-based study suggested a n association among sudden hearing loss and chronic rhinosinositis(19) which is also in line with our findings. So itcan be concluded that one of the causes of hearing loss is chronic nasal obstruction.

Sleep apnea and snoring was more reported in patients with chronic nasal obstruction. A retrospective study reported prevalence of non-allergic nasal obstructionin 45%

Table 4. Oral physical examination in case and control group

Examinations		Case group	Control group	P-value
Greatness of tongue	Yes	14(20%)	1(1.4%)	0.001
	No	56(80%)	69(98.6%)	
Large size of tonsils	Yes	3(4.2%)	2(2.8%)	0.64
	No	67(95.8%)	68(97.8%)	
Long uvula	Yes	19(27.1%)	1(1.4%)	0.001
	No	51(72.1)	69(98.6%)	
Soft palate Redundant	Yes	22(31.4%)	0(0%)	0.000
	No	48(68.6%)	70(100%)	
Septal deviation	Yes	40(57.1%)	10(14.2%)	0.000
	No	30(42.9%)	60(85.7%)	
Inf.turbinate hypertrophy	Yes	34(48.5%)	2(2.8%)	0.000
	No	36(51.5%)	68(97.8%)	
Nasal polyposis	Yes	42(60%)	2(2.4%)	0.000
	No	28(40%)	68(97.8%)	
Larg size of neck	Yes	9(12.8%)	2(2.4%)	0.055
	No	61(87.2%)	68(97.8%)	
Mallampati score		2.19 ±0.74	1.03 ±0.16	<0.001

Table-5. STOP-BANG questionnaire score

Percentage	Freguency	Score
28.6	10	Low risk
50	35	Intermediate risk
21.4	15	High risk

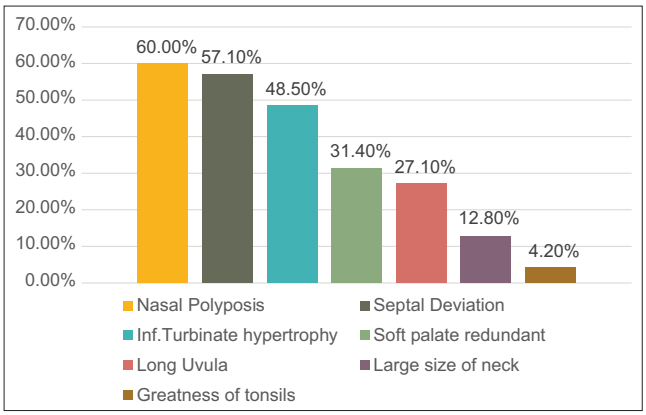

Chart 1. Causes of chronic nasal obstruction

of patients with sleep disorders(23) There are conflicting results regarding the severity of sleep apnea and effect of rhinoplasty. The two meta-analysis previously mentioned by Ishi et al(2015) and Lee et al(2011) including small, purely randomized, controlled studies(20,21). These studies showed no improvement in the severity of sleep apnea with rhinoplasty. A small meta-analysis by Wu et al(2017) showed remission in severity of sleep apnea after surgery(22). According to the present study there is a significant relationship between sleep apnea and nasal obstruction but based on this, it is not possible to comment on the reduction of sleep apnea after surgery beacause in this study, patients were not followed after surgery. Many researches have discussed about association of polyposis, chronic nasal obstruction and rhinosinusitis and in most of them the main reason of chronic nasal obstruction and rhinosinusitis has been reported polyposis(23,24). In our study polyposis was reported significantly high in case group.

The role of nasal obstruction in patients with sleep disorders in the last two decades has been studied.unilateral or bilateral nasal obstruction was associated with snoring and OSAS in one study with large sample(25). In some studies STOP-BANG questionnaire has been reported as a good way to assess sleep apnea(26,27) but one study that has done by Sankar et al(2019) reported that it can't predict complications and rate of mortality after surgery(28).

Sleep apnea has been widely studied since the discovery of that and has been proved that it is an important and prevalent disease and it can associated with most comorbidities(29,30) but in results of our study there was no difference between case and control group in terms of prevalence of diabetes, dislipidemia and coronary artery disease. Perhaps these contradictory results are due to the fact that in our study patients with chronic nasal obstruction were examined but in others upper respiratory obstruction syndrome was studied.

In studies have been done in Brazil and european countries the prevalence of chronicnasal obstruction was reported high in male gender(31,32) which was in line with ourstudy.

Currently evaluating nasal obstruction limited to anterior rhinoscopy which can provides examination of anterior wall deviation and size of inferior turbinate but it can't help to recognize other factors (33).

CONCLUSION

In this study septal deviation, soft palate redundant, large tongue, nasal polyposis and inferior turbinate hypertrophy were more prevalent in case group than control group.

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