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SNOT 22 SCORES IN DEVIATED NASAL SEPTUM PATIENTS: SYMPTOMATIC VERSUS ASYMPTOMATIC

ABSTRACT:

Objective:

This study aims to compare SNOT 22 scores between normal patients with deviated nasal septum without symptoms (DNS) and symptomatic patients.

Materials & Methods:

A cross-sectional study was carried out in Nepalgunj Medical College from January 2016 to March 2018. SNOT 22 scoring was recorded from patients planned for septoplasty (study group) and was compared with scoring of DNS patients without direct symptoms of deviated septum (control group).

Results:

There were 107 control group subjects and 60 study group patients. Average total SNOT 22 score in the control group was 1.6 while it was 29.7 in the study group. Four symptoms had mean scores more than 2, which include cleaning of nose, nasal blockage, nasal discharge and facial pain. All 22 items had a significant ($P < 0.001$) lower symptom score in the control group. Nasal blockage mean score was 2.82 in the study group which equates to moderate problem compared to 0.07 in the control group almost equating to no problem. Scores of psychological and cognitive symptoms were also higher comparable to nasal symptoms in the study group.

Conclusion:

Symptomatic DNS have significant higher scores in all items of SNOT 22 when compared with asymptomatic DNS. Four symptoms: cleaning of nose, nasal blockage, nasal discharge and facial pain were scored as moderate by symptomatic patients while nasal blockage was the major complaint in patients with symptomatic DNS.

Keywords: Deviated Nasal Septum, SNOT 22, Symptomatic DNS

INTRODUCTION

Patients with symptoms, due to deviated nasal septum, are commonly presenting in otorhinolaryngology clinics. A grossly deviated septum completely obstructing a nasal passage undoubtedly needs surgery. However, there is a dilemma in less pronounced deformities and symptoms and surgeons discretion for therapeutic decisions is relied upon in such cases. Majority of such decisions involve surgery. As patient's expectations from the

surgery are often different from those of surgeons, an accurate preoperative subjective evaluation is must.

Although we have objective measures for assessment of symptoms such as rhinometry and acoustic rhinomanometry^{1,2}, studies have shown that these measures tend to correlate poorly with symptomatology and are inconsistent when predicting outcomes.³ Nowadays health care service has become increasingly shaped by patient's needs and preferences, hence

the patients subjective preoperative and postoperative evaluation should be considered.

The nasal septum is a midline structure dividing the nasal cavity into two halves. Deviated Nasal Septum (DNS) is an asymmetric bowing of the nasal septum that leads to narrow nasal cavity.⁴ Micro fractures sustained during late intrauterine life and during birth may cause weakness in the damaged side of the cartilage and bone.⁵ Up to 20 percent of babies born have deviated noses. Majority springs back into place but about 1-2 per cent are left with a permanently deviated nasal septum. The nasal septum together with the nasal dorsum is responsible for the aesthetic form of the nose. However, a straight nasal septum is not a common finding in adults and it is estimated that about 75–80% of individuals exhibit some type of anatomic deformity of the septum.⁶

Deviated nasal septum (DNS) remains asymptomatic usually, although it may cause nasal obstruction, nasal discharge, facial pain, epistaxis, and disturbance of smell and other symptoms. The dynamics of airflow in the nasal cavity is affected by the location, severity, and types of DNS.⁷ Compensatory hypertrophy of the mucosa of the lateral nasal wall on the opposite side may also add up to symptoms. Nasal obstruction is one of the most common problems in such patients. Nasal septal deviation with a contact point on the lateral nasal wall can trigger episodic or daily headache and facial pain. They may be caused by sinusitis, a common associated disease in DNS patients.⁸ Snoring is a common sleep symptom due to DNS. These changes in the sinonasal cavity impair the quality of life and may need septum and sinus surgery.

Rhinologists are facing an ever-increasing demand to demonstrate their efficacy and result of surgery. There is a growing trend of patient-centered health service with a strong emphasis on clinical outcomes as an assessment tool of success of intervention; hence patient reported outcome measures (PROMs) are playing an ever more important role. One such PROM, now widely adopted among otorhinolaryngologists, is the sino-nasal outcome test (SNOT). The 22-item Sino-Nasal Outcome Test (SNOT-22) is a fully validated and easy-to-use outcome measure in rhinology.⁹ The SNOT has multiple

items that represent how nasal disease affects Quality of Life (QoL) including physical problems, functional limitations, and emotional consequences.¹⁰ Sino Nasal Outcome Test (SNOT)-22 is a disease-specific outcomes measure questionnaire with a combination of rhinologic issues with general health issues. It was first developed by Anderson et al¹¹ in 1998. The widely accepted version is the SNOT-22, which contains 22 items reflecting various elements; rhinological symptoms, ear and facial symptoms, sleep functioning, and psychological factors that may be associated with nasal and paranasal disease.¹² Such subdivision of the SNOT score ostensibly improves its clinical utility and precision.

Originally SNOT 22 was used to assess chronic rhinosinusitis quality of life but applications have since extended and have included patients with obstructive sleep apnea,¹³ those undergoing nasal septal surgery^{14,15} and also turbinate reconstruction.¹⁶ It is a useful tool in nasal septal surgery because it combines both nasal specific and general health questions, which can be analyzed individually or together.^{14,17} However the difference in degree and profile of symptoms in patients labeled as symptomatic DNS as compared to asymptomatic innocent looking DNS has not been studied. This study aims to compare SNOT 22 scores between normal patients with DNS and symptomatic patients.

MATERIALS AND METHODS

A cross-sectional comparative study was carried out in Nepalgunj Medical College from January 2016 to March 2018. All the symptomatic DNS patients presenting to outpatient department planned for surgery were enrolled in the study. Informed consent was taken from the patients and ethical approval was taken from Institutional review board (IRB) of Nepalgunj Medical College. The following exclusion criteria were applied: less than 18 years of age, concomitant diseases in and around nose like sinusitis, allergic rhinitis, nasal polyposis, septal perforation, enlarged tonsils or base of tongue, facial trauma, tumors, pregnancy, congenital malformations and past nasal surgery. Patients with deviated nasal septum but without any symptoms directly related to deviated septum was taken as control group. These were patients presenting to the ENT department with ear, throat

and neck complaints not directly related with deviated nasal septum. Exclusion criteria as in the symptomatic group were applied.

An assessment was made using the SNOT-22 score (Fig. 1) in both groups. Patients rated 22 different symptoms related to both nasal and general health on a score of 0 (no problem) to 5 (problem as bad as it can be). Incompletely filled forms were discarded. All symptoms between both groups were compared and were analyzed using SPSS 20.0 version. Descriptive statistics were tabulated while unpaired t-test was applied to find statistical difference in symptom score. Statistical significance was labeled when $p < 0.05$.

RESULTS

There were 107 control group subjects and 60 study group patients. In the control group minimum age was 18 years and maximum was 71 years with mean of 29.88 years. In the study group or symptomatic DNS patients, age range was the same with mean of 30.7 years. In the control group 64.5% were male while males were 70% in the study group. (Table 1)

Average total SNOT 22 score in the control group was 1.6(SD= 2.9) while it was outnumbered in the study group with mean of 29.7(S.D=4.1). As shown in table 2 the mean score of each 22

Table 1. Age and sex distribution of control and study group

	Total subjects	Male	Female	Age (years)			
				Minimum	Maximum	Mean	Std Deviation
Control group	107	69	38	18	71	29.88	11.96
Study group	60	42	18	18	71	30.70	12.17

Table 2. Scores of different SNOT 22 items in control and study groups (S.D: Standard Deviation)

SNOT 22 items	Control group (N=107)				Study group (N=107)				P value
	Minimum	Maximum	Mean	S.D	Minimum	Maximum	Mean	S.D	
Need to blow nose	0	2	.06	.302	1	4	2.32	.854	P < 0.001
Sneezing	0	4	.23	.623	0	5	1.58	1.344	
Runny nose	0	2	.07	.298	0	3	1.48	.792	
Nasal blockage	0	1	.07	.248	2	4	2.82	.813	
Loss of sense of Smell/ taste	0	3	.16	.535	0	4	1.20	1.147	
Cough	0	2	.13	.436	0	2	.62	.585	
Post nasal drip	0	3	.07	.370	0	2	.57	.563	
(Thick)Nasal discharge	0	1	.06	.231	1	3	2.10	.630	
Ear fullness	0	1	.04	.191	0	2	.67	.914	
Dizziness	0	3	.12	.428	0	2	.35	.577	
Earache	0	1	.07	.248	0	2	.47	.596	
Facial pain/pressure	0	1	.04	.191	1	4	2.00	.844	
Difficulty falling asleep	0	2	.07	.298	0	2	.27	.548	
Waking up at night	0	1	.05	.212	0	2	.37	.637	
Lack of a good night's sleep	0	2	.04	.235	0	3	1.22	.940	
Waking up tired	0	1	.04	.191	0	2	1.33	.752	
Fatigue	0	1	.05	.212	1	2	1.55	.502	
Reduced productivity	0	3	.10	.433	0	3	1.95	.982	
Reduced Concentration	0	1	.07	.248	0	3	1.63	.974	
Frustrated/Restlessness/Irritable	0	1	.06	.231	0	4	1.87	1.081	
Sad	0	1	.05	.212	0	3	1.48	.930	
Embarrassment	0	1	.03	.166	0	4	1.87	.999	

items in the control group was less than 1 with the highest mean score of 0.23 in sneezing complaints.

Table 3. Percentage of patients with symptoms in both groups

SNOT 22 items	Symptom percentage (at least 1)	
	Control group	Study group
Need to blow nose	3.7	100
Sneezing	15.8	86.6
Runny nose	6.5	96.6
Nasal blockage	6.5	100
Loss of sense of Smell/taste	10.2	71.6
Cough	9.3	56.6
Post nasal drip	3.7	53.3
(Thick)Nasal discharge	5.6	100
Ear fullness	3.7	36.6
Dizziness	9.3	16.8
Earache	6.5	41.6
Facial pain/pressure	3.7	100
Difficulty falling asleep	6.5	21.6
Waking up at night	4.6	28.3
Lack of a good night's sleep	2.8	70.0
Waking up tired	3.7	83.3
Fatigue	4.6	100
Reduced productivity	2.8	88.3
Reduced Concentration	6.5	83.3
Frustrated/Restlessness/Irritable	5.6	86.6
Sad	4.6	83.3
Embarrassment	2.8	93.3

In symptomatic or the study group, the mean score of 7 items were less than 1 and these items include cough, posterior nasal discharge, ear fullness, dizziness, earache, difficulty falling asleep and waking up at night. Four symptoms had mean scores more than 2, which include need to blow nose, nasal blockage, nasal discharge and facial pain, while remaining items had average scores between 1 and 2. Nasal blockage mean score was 2.82 in the study group which equates to moderate problem compared to 0.07 in the control group almost equating to no problem. All 22 items had a significant ($P < 0.001$) lower symptom score in the control group.

All the patients in the study group had some sort of complaint regarding need to blow

nose, nasal blockage, nasal discharge, facial pain and fatigue (Table 3). Last four SNOT 22 symptoms were also in higher proportion reflecting the significant role of DNS causing psychological and cognitive effects. Sleep related symptoms were not remarkable unlike anticipated. In the control group only sneezing and decreased smell had a percentage more than 10.

DISCUSSION

The SNOT score was originally developed and validated as a rhinosinusitis specific, health-related questionnaire and combines both symptoms related to the nose and general health. Previously separate tools were used to evaluate the change in nasal and non-nasal symptoms and using SNOT score to measure the outcome after septal surgery is novel and comprehensive. This is a single questionnaire that can quickly be completed in an out-patient setting by the patient and can be repeated easily.

There is a considerable risk of patient dissatisfaction in DNS, if patients are selected for surgery on clinical grounds alone. Pre-operative rhinomanometry data also failed to prove useful in predicting the long term surgical outcome.¹⁸ Dissatisfactions of patients are encountered sometimes following septoplasty; hence preoperative symptomatology assessment in a comprehensive method is useful. It has not been investigated in DNS that by how much the symptoms of patients, that we and they themselves choose to undergo septoplasty, are different from that of patients whom we don't feel to need septoplasty. So comparison of these two groups was must.

Unlike Pannu et al.¹⁷ and Buckland et al. study¹⁴, we had almost all patients complaining of some degree of nasal obstruction, discharge, need to blow nose, facial pain and fatigue. These are major symptoms which makes a surgeon decide that septoplasty will benefit the patient. Their study showed about three fourth patients having nasal obstruction, which may be a difference in symptom score taken into account. In our study even score 1 was taken into account.

Some studies have suggested that patients with nasal septal deviations have abnormal levels of nasal health and normal levels of

general health.¹⁹ However in our study general health were also abnormal and similar to nasal symptoms. This is in accordance to a study from China²⁰ which states that the preoperative self rating anxiety and self rating depression (SAS/SDS) scores of the nasal septum deviation patients were higher than those of the national standards. This is important as psychological and cognitive symptoms are comparable with nasal symptoms which are usual markers to decide for surgery. The postoperative improvement in all these symptoms are required to be assessed in future studies.

Mean score of nasal obstruction in symptomatic patients was 3.9 in study by Buckland et al,¹⁴ while it was almost 1 score lower in our study. So in Nepal patients opt for surgery in moderate nasal symptoms compared to the United Kingdom where surgery was advised in patients with symptoms equating to severe nature. However, opting for surgery may not only be decided with medical and psychological grounds but also by the cultural and health care system of the country. Mean score of facial pain was 2.0 in our study and it was exactly the same as in Buckland et al study.¹⁴ The mean score of nasal discharge in symptomatic case was 2.1 which is comparable to 1.4 as in Buckland et al study.¹⁴

The mean total preoperative SNOT-22 score (all 22 items) was 36.3 in Buckland et al study¹⁴ which is slightly higher than that of ours (29.7). It again indicates may be surgeons and patients opt for surgery at relatively milder symptoms in Nepal as compared to the United Kingdom.

SNOT 22 has been validated and been widely used in chronic rhinosinusitis and was not primarily not devised for DNS. Some important symptoms like headache, epistaxis, external deformity and dryness of nose are not addressed in SNOT 22. These symptoms do play a role in deciding for surgery when a DNS patient presents with some symptoms. However, SNOT 22 appears to be comprehensive as it includes general health and psychological symptoms as well. Hence, a revised version of SNOT 22 can be made and validated encompassing these symptoms to make it more useful clinically for deviated nasal septum.

CONCLUSION

Symptomatic DNS have significant higher scores in all items of SNOT 22 when compared with asymptomatic DNS. Moderate problems were scored in need to blow nose, nasal blockage, nasal discharge and facial pain symptoms by symptomatic patients while nasal blockage was the major complaint in patients with DNS.

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