

Prevalence of Deviated Nasal Septum in Curitiba, Brazil

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RESUMO

Introdução: A obstrução nasal freqüentemente tem como causa algum tipo de deformidade do septo nasal. Dados sobre a prevalência do desvio do septo nasal são raros e quando encontrados, muitas vezes são discrepantes.

Objetivo: Determinar a prevalência do desvio do septo nasal em Curitiba, Brasil.

Método: Neste estudo transversal, foram avaliados 534 voluntários, 322 do sexo feminino (60,3%) e 212 homens do sexo masculino (39,7%), participantes do Programa de Qualidade de Vida da Universidade Federal do Paraná e transeuntes da Feira do Largo da Ordem de Curitiba, de fevereiro a julho de 2004. A avaliação constou da marcação subjetiva da percepção da respiração nasal pelo voluntário em Escala Visual Analógica (EVA) de 0 a 100mm, de um questionário sobre a presença ou não de rinites e de exame de rinoscopia anterior.

Resultados: Dos 534 voluntários, 60,3% apresentaram desvio do septo nasal e destes, 59,9 % referiram obstrução nasal. Foi mais freqüente em homens (25%) do que em mulheres (23,6%). O valor médio do escore EVA, que se aproximou de 100mm (respiro mal pelo nariz), foi de 38,10mm nos indivíduos com desvio do septo nasal enquanto o valor médio que se aproximou de 0mm (respiro bem pelo nariz) ocorreu no grupo sem desvio do septo nasal, 21,14 mm (p<0,0001%).

Conclusão: Desvio do septo nasal é uma alteração anatômica comum, na maioria das vezes é sintomático e é mais comum em homens.

Unitermos: septo nasal, deformidade, obstrução nasal, prevalência.

ABSTRACT

Introduction: Nasal obstruction is often caused by a nasal septum deformity. Data about the prevalence of nasal septum deviation is rare and, when available, there are frequent discrepancies.

Objective: To determine the nasal septum deviation prevalence in Curitiba, Brazil.

Methods: In this cross-sectional study, we investigated 534 volunteers, 322 female (60.3%) and 212 male (39.7%), participants of the Federal University of Paraná Program for Life's Quality and passers-by of the Largo da Ordem Open-air Market, from February until July in 2004. The evaluation was composed of subjective marking of the nasal breathing perception by the volunteers in a Visual Analogic Scale (VAS) from 0 to 100mm, a questionnaire about the presence of rhinitis and anterior rhinoscopy exam.

Results: Among the 534 volunteers, 60.3% presented with nasal septum deviation, whose 59.9% reported nasal obstruction. It was more usual among male (25%) than female (23.6%). The VAS score's average value that approached to 100mm ("I breathe badly through my nose") was 38.10mm within the nasal septum deviation group, while the average value that approached to 0mm ("I breathe well through my nose") occurred in the group without nasal septum deviation, 21,14mm ($p < 0.0001$).

Conclusion: Nasal septum deviation is a common anatomic alteration, mostly symptomatic and more common among males.

Key-words: nasal septum, deformity, nasal obstruction, prevalence.

INTRODUCTION

The nasal septum is a osseous-cartilaginous structure in the middle of the nose that is designed to separate the two sides of the nose, allows air flow, is part of nasal valve (1) and helps the nose to run its functions such as warming, humidify, filtering, helping with olfaction and phonation.

When septum is deviated, nasal obstruction can occur, what is a very common complaint by patients. Many times its diagnosis is done only by anamnesis and otorhinolaryngology exam, which involves anterior rhinoscopy with nasal speculum.

Air pathway blocked by a nasal septum deformity (either by deviation, spur or crust) can be symptomatic (with nasal obstruction) or not (without nasal obstruction). Although it is a respiratory tract disorder, the evaluation of this

anatomic alteration is not classified as for its grade of nasal obstruction, sometimes it is fixed by subjectiveness of patients' complaint and its relation with rhinoscopy findings (2). The classification of types of nasal septum deviation (NSD), such as by COTTLE AND BY MLADINA (3) is different; there is not a gold standard exam that evaluates nasal permeability and, besides, there is little about NSD prevalence in the literature.

This is due to the fact that it is nearly impossible to attest if there is a relation between nasal septum deviation and nasal obstruction, and its consequences such as alterations on life quality, and on night sleep as snoring and apnea; orthodontic alterations; rhinosinusitis; growing sequelae and craniofacial distortion. Though having NSD, these alterations can occur or not, especially in cases of partial reduction of nasal permeability (4).

Reliable studies on septal distortion prevalence and other obstructive diseases that are often associated to NSD, as rhinitis, can help to determine instructions as for its diagnosis and treatment.

MIN et al in 1995 (5) did a study, in different places, with 9284 volunteers in Korea, showing the prevalence of NSD in 22.38% of the population, with a predominance in men. TOCIK in 1989 (6) also showed NSD 3 or 4 times bigger in men.

In 1978, the prevalence of NSD was studied by GRAY AND FRACS in 2112 grown cranium. It was presented that 21% of straight nasal septa and 79% with some deviation (7). The authors say that MACKENZIE (1880) found 23% of straight septa and 77% with deviation.

In 2002, in Turkey, UYGUR et al. (8) reported that 15.6 % of newborns from natural birth had nasal septum deviation and 3.4 % nasal septum displacement; in 15.1% of newborns from cesarean birth had nasal septum deviation and no septum displacement.

The causes of nasal obstruction are often some type of nasal septum deformity (9). The data on NSD prevalence are rare and many times not consistent (10,11). Though, our target is to determine the prevalence of individuals with nasal septum deviation.

REPORTS

This study was approved by Ethics Committee of *Hospital de Clínicas da Universidade Federal do Paraná* (Clinical Hospital of Federal University).

534 Caucasian passers-by, aging from 2 to 83 years were analyzed in Curitiba/PR – Brazil. They were aleatorily invited by medical students to undergo nasal septum evaluation, avoiding specific search by the ones who had alterations of nasal function and then took the advantage to be examined (avoiding mistakes on selection of patients), and there were also participants from *Programa Institucional de Qualidade de Vida da Universidade Federal do Paraná* (Federal University of Paraná Program for Life's Quality)

METHOD

Firstly, each volunteer answered a questionnaire about the presence or not of nasal obstruction, itching, aqueous rhinorrhea and sneezing, and did subjective marking of their nasal breathing perception in a Visual Analogic Scale (VAS) from zero to 100mm. Zero corresponded to "I have no obstruction, I can nose-breathe"; 50 corresponded to "I can hardly nose-breathe" and 100 meant "I have obstruction" (Table 1).

After this marking, each volunteer was examined by the same professional, in sitting position. It was done anterior rhinoscopy with disposable nasal speculum and an evaluation to verify the presence or not of nasal septum deviation, hypertrophy of nasal conchas, hyperemia, paleness, cyanosis of nasal mucosa or nasal concha degeneration, which would lead to the rhinitis clinical diagnosis, excluding the infectious ones. The confirmation criteria of nasal septum correction was called straight septum, and its bending was called nasal septum deviation, not counting its localization or type (in C, in S, caudal, spur, crust, posterior, superior, area 1, area 2, etc) (3). The possible existence of previous nasal surgery in the volunteers was taken into consideration during sample evaluation.

To statistical evaluation of the variables of nasal obstruction symptom, it was used the Fisher test. To respiration evaluation percentage, it was used the non-parametric Mann-Whitney test. In all tests, a value of $p < 0.05$ was taken as statistically and significant.

RESULTS

From the 534 volunteers, 60.3% were female and 39.7% were male. The age average was 35.93 years, with standard deviation of 17.48 (Table 2). Among them, 322 presented NSD (60.3%), from those, 190 were female (59 %) and 132 male (41%). The prevalence that was corrected from the sample (because of the difference in absolute number of individuals of each sex) was 25% of NSD to male and 23.6% to female.

From the 190 female and 132 male volunteers with DSN, 60% of each felt nasal obstruction.

From the 534 volunteers, 212 did not present NSD (39.7%). From those, 132 were female (62.3%), and from these last ones, 24 (18%) felt nasal obstruction. Among men, 80 (37.7%) did not present NSD and 15 from them (19%) had nasal obstruction (Table 3).

The Visual Analogic Scale showed that the score of the group of individuals with NSD was 38.10, with standard deviation of 33.06; and the score of the group of individuals without NSD was 21.14, with standard deviation of 26.43; ($p < 0.0001$) (Table 4).

From the 534 examined individuals, 18.3% presented complaints and exams which were compatible with rhinitis; 24.4% with NSD and 18.9 % without it.

From the 534 volunteers, 9 (1.7%) had previous nasal surgery (septoplasty); 6 of them presented residual NSD. 4 out of those 6 (67%) with nasal obstruction and 2 (33.4%) without it. Among the 3 ones who underwent surgery and did not present DSN, 100% had no nasal obstruction (Table 6).

DISCUSSION

"Nasal respiratory deficiency, when determined by nasal septum malformation, can present embarrassed clinical situations in relation to having the opportunity or not of surgical recommendation" (12). This is a very common quotation from the literature. It is very common to find nasal septum deflection in patients who did not refer nasal obstruction (4), remembering that 40% of the volunteers from this study had NSD and were non-symptomatic patients.

We have found 60.3% of NSD prevalence, 25% were in men and 23.6% in women, which agrees with the literature. The most frequent etiology of NSD is nasal trauma, what occurs in men more often.

The percentage of volunteers with NSD and nasal obstruction was 60%, for both men and women. This NSD prevalence is close to the statistics of GRAY (7) which are 79%, and far from the numbers of MIN et al. (22.3%) (5). The former examined skulls, so, only bone deviation could be seen. As cartilaginous septum deviation was not seen, it is supposed that its prevalence is greater. The latter did a study in different places and made the use of a doctor team to examine 9284 volunteers and the criteria to determine the presence and absence of NSD were possibly varied.

The Visual Analogic Scale scores showed that the individuals who said they could nose-breathe were close to the score of 21.14mm and those who said they hardly could do it were close to 38.10mm (Table 4), in relation to volunteers without NSD and with NSD respectively ($p < 0.0001$). This can indicate that most of volunteers correctly scored breathing perception.

Rhinitis prevalence agrees with the literature, i.e. 18.3% (without specification for any type of rhinitis) ($p < 0.0001$). Those who had NSD associated to rhinitis added 24%, and those who did not have it added 18.9% (Table 5). Rhinitis can cause nasal permeability, so this diagnosis should be taken into consideration when analyzing nasal obstruction, but it did not interfere in the findings of prevalence of NSD.

From the 9 individuals (1.7%) who had previous nasal surgery (septoplasty) (Table 6), 6 of them presented residual NSD, 4 (67%) with nasal obstruction and 2 (33.4%) without it. The statistical analysis in relation to age and sex showed that they did not influence the symptom, with $p = 0.3609$ and $p = 0.6478$, respectively (Table 7).

The lack of gold standard complementary exams and the recommendation that the author should be the examiner (the subjectiveness on exam of nasal fossa varies from doctor to doctor) reduces the research production to determine nasal permeability (13,14).

The subjective marking of breathing perception on visual analogic scale, the questionnaire about rhinitis symptoms (excluding the viral and bacteria ones) and about previous treatment to allergy, allergy tests, previous nasal surgery history precede anterior rhinoscopy.

To determine if different septum deviations bring some type of respiratory alteration to patient, knowing that some NSD visually interfere in nasal respiration, is used as criteria for NSD treatment.

Nose holds physiological mechanisms which also interfere on nasal permeability (e.g.: nasal cycle) (15), because of that surgical recommendation can become a visible question to doctor and patient.

To determine the prevalence of nasal septum deviation in different people certainly leads attention to the necessity of creating more effective mechanisms, which help recommending surgical treatment when the professional has a patient with nasal septum deviation.

CONCLUSION

Nasal septum deviation is a common anatomic alteration (60%), most of time it is symptomatic (60%) and more common in men.

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Table 1. Visual Analogic Scale Model.

0 50 100

0= I can nose-breath (I have no obstruction);
 50= I can hardly nose-breath; and
 100= I cannot nose-breath (I have obstruction).

Table 2. Descriptive Statistics of age according to presence of nasal septum deviation.

NSD Symptom		N	Average Age	SD
Yes	Yes	193	35.56	16.50
	No	129	41.83	15.87
No	Yes	39	33.18	18.60
	No	173	32.55	18.33
General		534	35.93	17.48

Subtitle: NSD = nasal septum deviation; N = absolute number of individuals; SD = standard-deviation.

Table 3. Association of symptom with presence or not of nasal septum deviation.

Symptom ^A	Septum deviation			
	Yes		No	
	Male	Female	Male	Female
No	53	76	65	108
Yes	79 (60%)	114 (60%)	15 (19%)	24 (18%)
Total	132	190	80	132

Subtitle: A= Nasal obstruction as a symptom was considered. Level of significance of 5% (p=1).

Table 4. Score in mm of Visual Analogic Scale, with or without septum deviation.

	Average standard Deviation	
With NSD	38.10	33.06
Without NSD	21.14	26.43

Subtitle: NSD = nasal septum deviation.

Table 5. Association of septum deviation with complaint of nasal obstruction and rhinitis

Symptom ^A	Septum deviation			
	Yes		No	
	With rhinitis	Without rhinitis	With rhinitis	Without rhinitis
No	8	121	13	160
Yes	71 (90%)	122 (50%)	27 (68%)	12 (7%)
Total	79	243	40	172

Subtitle: A= nasal obstruction as symptomatic complaint. Level of significance of 5% (p<0.0001).

Table 6. Relation between the presence of symptom, septum deviation and previous septoplasty.

Symptom ^A	Septum deviation			
	Yes		No	
	With Septoplasty previous	Without Septoplasty previous	With Septoplasty previous	Without Septoplasty previous
No	2	127	3	170
Yes	4 (67%)	189 (60%)	0 (0%)	39 (19%)
Total	6	316	3	209

Subtitle: A= nasal obstruction as symptom. Level of significance of 5% (p=1).

Table 7. Statistical Analysis.

Variable	p Value
Age	0.3609
Sex	0.6478
Septum deviation	<0.0001
Rhinitis	<0.0001