

Definition, prevalence and development of nasal obstruction

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Introduction

Nasal obstruction is defined as discomfort manifested as a feeling of insufficient airflow through the nose. Thus defined, nasal obstruction is a subjective complaint. Common synonyms for nasal obstruction are nasal stuffiness and nasal blockage. However, some authors have considered the word "obstruction" to imply the existence of an obstacle in the nose, thus suggesting the term to have an objective importance.

Regarding the term nasal patency, prevailing opinion in the literature is that it denotes an objective measure of how open the nose is. The practically useful methods, which in a strict sense measure nasal patency, are acoustic rhinometry, computed tomography and magnetic resonance imaging. Often rhinomanometry and nasal peak flow measurements are also included among the methods for measuring nasal patency, although they record nasal airflow with and without, respectively, simultaneous pressure recordings. The latter methods yield data on the dynamic function of the nose, whereas acoustic rhinometry and imaging provide a static impression of nasal function.

"Congestion" is another word often used regarding the nose. It is used by the clinician examining the nose, or in research to denote swollen mucosa caused by dilatation of the capacitance vessels. Decongestants act by constricting blood vessels.

Increased nasal obstruction is not always accompanied by increased nasal airway resistance (NAR), decreased nasal peak flow, or reduced acoustic rhinometry values. Nasal obstruction is also one of the complaints of patients with atrophic rhinitis, a disorder with wide nasal cavities. In the presence of a common cold, NAR may, at least periodically, be within normal limits, despite the patient's sensation of nasal obstruction.

On the other hand, spraying the nose with menthol increases the sensation of nasal patency with-

out affecting nasal airway resistance (1). Menthol probably stimulates nasal trigeminal sensory receptors, thus creating a sensation of improved airflow.

Because all inflammations of the nasal mucosa, whatever the cause, evoke nasal obstruction, this symptom is a very common complaint. Nasal obstruction is often also the result of trauma to the nose causing a narrowing of the nose, and because trauma to the nose is rather common, nasal obstruction is even more common.

What one patient considers to be nasal obstruction may bother other patients very little, as with nasal secretion and sneezing. Thus, it is difficult to obtain a realistic estimate of how common nasal obstruction is. When asking a patient questions regarding nasal obstruction directly via a questionnaire, it is important to include the time factor in the question, not only the degree of obstruction or whether it is unilateral or bilateral. It is also necessary to know whether obstruction is continuous, occurs only at night, or only after exercise, for example. It is not surprising that very few authors are willing to commit themselves as to how common nasal obstruction is in the general population. On the other hand, there have been many reports regarding the prevalence of different nose diseases or disorders in which nasal obstruction is very common or an obligatory symptom. Therefore, an evaluation of how common these diseases are might yield an approximate figure for the frequency of nasal obstruction.

Prevalence of nasal complaints in an urban and a rural population in Sweden

By questionnaire, 1,469 randomly selected persons, 16–82 years of age, were asked whether they had suffered from such nasal complaints as obstruction, sneezing and discharge, during the previous 6 months (2). The 976 persons from the city of Malmö represented 0.4% of the city popula-

tion, and the 493 persons from the parish of Emmaboda represented 4.5% of the parish population. The proportion of people suffering from any type of nose complaint was 26.7% in the city group (mean age 42 ± 19 years), and 24.1% in the rural group (mean age 47 ± 19 years).

Anatomical causes

Septal deviations

If this review is restricted to adults, adenoids can be excluded as a cause of nasal obstruction. Other nasopharyngeal obstacles, such as tumours, are so uncommon that they add very little to the prevalence of nasal obstruction. However, septal deviations are very common, and some of them, usually those of late traumatic origin, often cause nasal obstruction.

In a large Korean series, Yang-Gi Min and coworkers found the prevalence of nasal septal deformity to be 22% in the series as a whole, 24% in the male subgroup and 20% in the female subgroup (3), though only 2.8% of the series complained of nasal obstruction. Of the nasal septal deformities, 56% were left-sided, 39% right-sided, and 5% S-shaped. There was a tendency for the incidence of nasal septal deformity to increase with age.

In Malmö, a city in southern Sweden with a population of about 250,000, a level that has remained fairly stable for the past 20 years, all surgical corrections of the nasal septum are performed at the ENT department of the only hospital serving the community. During the past two decades, about 100 septoplasties, with or without simultaneous turbinectomy or correction of the outer shape of the nose, have been performed annually. The annual incidence of nasal obstruction due to septal deviation should thus be approximately 0.04%. The prevalence is more difficult to estimate, but probably does not exceed 1% (as calculated from the corresponding number of surgical interventions). However, based on a response to a questionnaire sent to about 1,500 randomly selected people, 16–82 years of age, Jessen & Janzon found 2–3% of the respondents to have had nasal obstruction attributable to nasal septum deviation (2).

Inflammatory causes

Allergic rhinitis

If the common cold is excluded, allergic rhinitis nowadays seems to be the most common cause of nasal obstruction. In a Danish study from 1978 of 2,000 randomly selected persons above 15 years of age, the prevalence of allergic rhinitis was esti-

mated to be 5% (4). For that evaluation, the authors used a sample of 70 persons who were skin prick tested, which is important because questionnaires alone are insufficient for the purpose of distinguishing allergic from non-allergic rhinitis. The often cited study by Åberg of Swedish conscripts did not include the skin prick test or blood tests (5). The prevalence evaluation of that report, however, clearly gives increasing figures over the years. Among about 55,000 18-year-old conscripts for each of the years 1971 and 1981, 4.4% and 8.4%, respectively, were considered by themselves and by examiners to have allergic rhinitis. In a follow-up report of a third group of conscripts in 1991, 12% were considered to have allergic rhinitis. According to Mygind, the figures usually reported of 10–15% include mild cases not seen by the doctor (6). In the above-mentioned questionnaire study from 1989 by Jessen & Janzon of 1,500 persons, 16–82 years of age, 4.5% considered themselves to be suffering from allergic rhinitis (2). Allergic rhinitis is most common in adolescence, improves considerably in middle age and almost disappears in old age. In 1966, Fry questioned 77 persons aged 50 years and over, who had suffered from "hay fever" in their youth, and for whom records were available, as to the persistence or cessation of symptoms (7). All but two had ceased to suffer from symptoms, and in 68% of the cases this had occurred between the ages of 30 and 50 years.

In 1993, 30 years after Fry's study, we performed a follow-up of our patients diagnosed as having allergic rhinitis between 1979 and 1982 (8); 82 of the patients, none of whom had received immunotherapy, answered a questionnaire concerning the status of their allergic rhinitis, and any development of the disease during the interim. Of the 82 patients, one was free of allergic symptoms, and 39% had become better; symptoms were unchanged in 39% and worse in 21%. Forty-six per cent reported lower airway symptoms of varying degrees. Seventyseven per cent had suffered from nasal obstruction at presentation, and 65% still suffered from nasal obstruction in 1993.

Non-allergic, non-infectious rhinitis

This category is usually taken to include rhinitis both of known and unknown origins. In the above-mentioned questionnaire study by Jessen & Janzon, 20.7% of the respondents fulfilled the criteria for non-allergic nasal complaints (2). The age and sex distributions are shown in Fig. 1. Most respondents reported a combination of the three main symptoms: nasal obstruction being reported by 66%, discharge by 59% and sneezing by 65%. The frequencies of the different symptoms were very

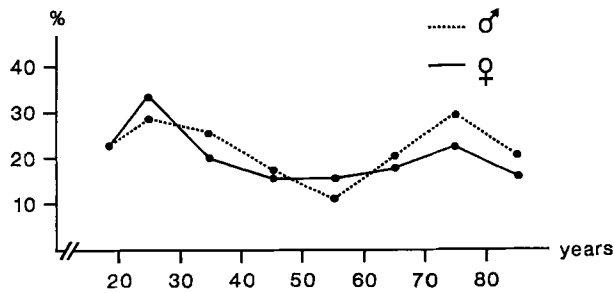


Fig. 1. Prevalence of non-allergic, non-infectious nasal complaints in relation to sex and age. From (2).

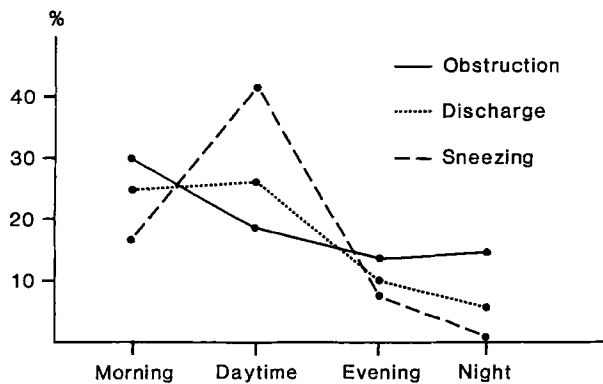


Fig. 2. Day and night variation of the nasal symptoms: obstruction, discharge and sneezing. From (2).

similar: 21% suffered from daily nasal obstruction, 20% suffered several days a week, and 25% suffered several days a months. Twenty per cent of those with nasal obstruction suffered from nasal obstruction either in their right or in their left nasal cavity only, 44% in both the left and the right cavity simultaneously, and 36% sometimes in the left nasal cavity and sometimes in the right cavity.

The duration of nasal obstruction exceeded 2 hours per day in 47% of the cases, was between 30 minutes and 2 hours in 27%, and less than 30 minutes in 26%. The 24-hour variation of the non-allergic nasal complaints is shown in Fig. 2.

Drug-induced rhinitis has not been uncommon over the years. Twenty to 40 years ago, most antihypertensives caused nasal congestion, in turn resulting in nasal obstruction. At that time, substances such as reserpine, guanethidine and methyldopa that interfere with the release of norepinephrine at sympathetic nerve endings were widely used. Most modern antihypertensives (e.g., beta-adrenoceptor agonist, diuretics, and angiotensin-converting enzyme (ACE) inhibitors) do not cause nasal congestion, although in a few per cent of the cases, ACE inhibitors induce increased nasal secretion. As with the fairly common coughing response, the probable cause of the increased nasal secretion is considered to be decreased degradation of substance P.

The prevalence of other kinds of non-allergic rhinitis of known origin, such as rhinitis medicamentosa, should be possible to calculate, but no figures seem to be available in the recent literature. A recent thesis from Sweden included a review of how common rhinitis medicamentosa is in ENT practice, and incidence figures of 1–9% were found (9). Although the prevalence of rhinitis medicamentosa should be very low, as compared with figures given here for other nose disorders, nonetheless the condition causes much trouble to both the patients and the clinician. Advice, saline solutions, corticosteroids, and in a few cases surgery of the anterior third of the lower turbinates, can help the patient to stop taking decongesting nose drops.

Hormone-induced nasal congestion and nasal obstruction, which can occur during pregnancy, are most likely also associated with low prevalence figures. In this context, it is of interest that modern oral contraceptives almost never cause nasal congestion.

It was mentioned above that ACE inhibitors were considered to reduce the breakdown of substance P. Substance P together with neurokinin A and calcitonin gene-related peptide are sensory neurotransmitters, and when released from the peripheral nerve endings they dilate blood vessels and increase vascular permeability, mucociliary activity and, at least in certain animals, glandular secretion. Substance P and neurokinin A are mainly degraded by a peptidase, neutral endopeptidase (NEP); it is of interest that tobacco smoke and the air pollutant toluene diisocyanate, used in plastics manufacturing, have been reported to reduce the activity of NEP.

Although non-allergic, non-infectious rhinitis of unknown etiology, usually called vasomotor rhinitis, is very common, prevalence or incidence figures are extremely seldom published. That inflammation is present and is an important cause of nasal obstruction is obvious from the finding that so many patients with vasomotor rhinitis are helped by topical corticosteroids (10).

The development of nasal complaints in patients suffering from nasal obstruction and with a normal NAR has been followed in two studies (11, 12). Of 67 patients, 18% had become free of their nasal obstruction between 1977 and 1982, and another 18% became free of their nasal obstruction between 1982 and 1989 (Fig. 3). In fact, nearly all of these patients were suffering from vasomotor rhinitis.

Nasal polyposis

In an autopsy series, Larsen & Tos found nasal polyps in 26% of the cases (13). None of the

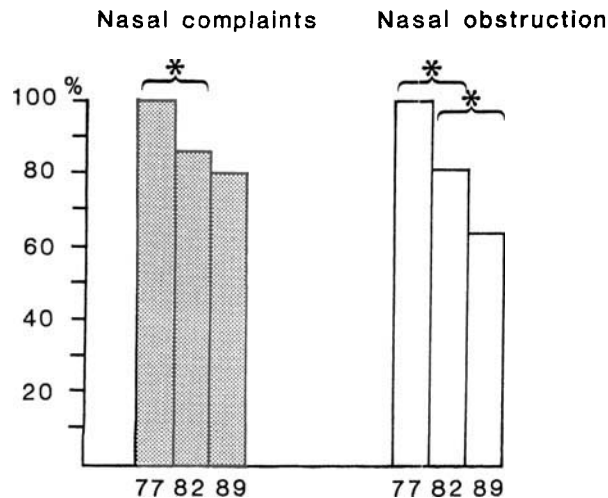


Fig. 3. The proportion of patients suffering from nasal complaints and nasal obstruction at follow-up in 1982 and 1989 as compared with the initial investigation in 1977. From (11, 12).

deceased had undergone rhinoscopy. In another autopsy study, based on a random screening of 300 cadavers for nasal polyps, using anterior rhinoscopy and a conventional headlight, Larsen & Tos found 2% to have nasal polyps (14). The conclusion to be drawn from their two studies is that most nasal polyps are so small that they do not give any symptoms. When nasal polyps do give rise to a nasal complaint, it is nasal obstruction. How long the interval is between the occurrence of nasal symptoms and diagnosis is, of course, not known; but nowadays when endoscopes are available, it should be easier to reach a correct diagnosis.

According to Drake-Lee, between 1 and 2% of the adult population in the UK suffer from nasal polyps at some time in their lives (15). He thus gives a figure of the cumulative prevalence (i.e., those ever having had symptoms). Because nasal polyps is a chronic disease, the prevalence figures probably do not differ much from the cumulative prevalence ones.

Calculated from the number of polyps removed with a snare in 1980 in the city of Malmö, at a time when almost all extirpated polyps were sent to the Department of Pathology, Malmö General Hospital for microscopic diagnosis, the prevalence should be between 0.1 and 1%. High prevalence figures, such as 3.6% in a Finnish study from 1974, probably derive from selected populations (16). In the population studied by Jessen & Janzon, previous surgery performed because of nasal polyps was reported in 1.2% of 234 persons diagnosed as having non-allergic nasal complaints (2). In a control group of 70 persons, 2.9% had had surgery performed because of nasal polyps.

Conclusions

Simple addition of the prevalence figures given above does not yield a fair estimate of how common nasal obstruction is. Many factors need to be taken into consideration, such as the duration of nasal obstruction. For example, if continuous obstruction during the previous 6 months is adopted as a criterion, many of those with allergic rhinitis would be excluded; and if all persons with nasal obstruction at night were included, the prevalence figures would be much higher. Because nasal obstruction is an increasingly common nasal complaint in modern society, this is sufficient reason to try to find the causes more often than we do.

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