

The Current State of Study of Vasomotor Rhinitis Modern Diagnostic and Therapeutic Methods

Nurova G. U., Nurov U. I.

Department of Otorhinolaryngology, Bukhara State Medical Institute, Uzbekistan

Abstract In recent years, there has been a significant increase in the prevalence of diseases of the nose and vasomotor rhinitis. Inflammatory diseases of the mucous membrane nasal cavities (rhinitis) are accompanied by difficulty but breathing and nasal discharge. Chronic forms of rhinitis affects 10-20% of the population, and in epidemiological studies, symptoms of rhinitis are noted in 40% of respondents [1,2]. The article provides a detailed analysis of the literature of recent years devoted to the diagnosis and treatment of vasomotor rhinitis. The current state of the conservative and surgical treatment of this pathology is described. The current state of clinical and pathogenic diagnostic aspects and terminology issues of vasomotor rhinitis is given. Details are the latest developments of scientists and specialists in the field of otolaryngology around the world. A characteristic is given to the modern methods of treating vasomotor rhinitis developed in recent years.

Keywords Vasomotor rhinitis, Diagnosis, Conservative and surgical treatment, Physiotherapy methods, Laser treatment

1. Introduction

Among the chronic forms of rhinitis, vasomotor rhinitis occupies a large place along with allergic, infectious, hypertrophic, catarrhal and atrophic rhinitis. In their relevance and medical and social significance of the disease of the upper respiratory tract always remain in the center of attention of specialists and organizers of health care all over the world. Among these diseases, rhinitis occupies a special place, especially their chronic forms. Vasomotor rhinitis as nosological units related to these diseases attracted the attention of not only otorhinolaryngologists, but also other specialists of medical and biological profile.

The terms "vasomotor rhinitis", "non-infectious year-round non-allergic rhinitis" (perennial nonallergic rhinitis - PNAR), "idiopathic rhinitis", "neuro-vegetative form of vasomotor rhinitis" are synonymous and include a group of similar in pathogenesis and clinical manifestations of diseases that can be found in a non-reactive rhinitis. various reasons [7,24,34]. Environmental degradation, environmental pollution, uncontrolled use of drugs, reduction of body defenses - all this caused an increase in the prevalence of vasomotor rhinitis.

Vasomotor rhinitis is characterized by a pathological condition of the mucous membrane of the nasal cavity (MMNC) of a non-inflammatory nature, which is basically a violation of the nervous mechanisms causing a physiological

state, with the result that irritants of exogenous and endogenous origin cause a hyperergic reaction. Paroxysmal sneezing, rhinorrhea, and difficulty in nasal breathing are characteristic of vasomotor rhinitis [19].

In ICD-10, vasomotor rhinitis and allergic rhinitis are included in one group (J30), followed by separation of vasomotor rhinitis into a separate subgroup (J30.0): J30.0 Vasomotor rhinitis; J30.1 Allergic rhinitis caused by plant pollen - allergy without further clarification caused by plant pollen, hay fever, pollinosis; J30.2 Other seasonal allergic rhinitis; J30.3 Other allergic rhinitis - perennial allergic rhinitis; J30.4 Allergic rhinitis, unspecified [ICD-10, 2007].

The following forms of vasomotor rhinitis are distinguished: caused by physical, chemical and toxic factors; psychogenic (the development of vascular imbalance is associated with the lability of the autonomic nervous system); idiopathic (it is not possible to identify the cause of rhinitis); mixed forms [17].

There are no reliable specific methods for diagnosing vasomotor rhinitis there is, so the diagnosis is usually established by exclusion of similar forms of rhinitis and identification of factors, provoking the appearance of symptoms [19]. By clinical manifestations all forms of year-round rhinitis quite similar, but with detailed questioning of the patient can reveal indirect signs of one or the other forms of rhinitis.

Studies conducted in different populations of a number of countries have shown that over the past 10 years, the incidence rate of this pathology has increased by an average of 11%, and now its incidence among the population of individual regions has increased to 16%, even 50% [9].

It has been established that 10-20% of the population of

the planet suffers from chronic forms of rhinitis, 40% of respondents noted rhinitis symptoms in themselves. Among them, a large place is occupied by vasomotor rhinitis along with allergic, infectious, hypertrophic, catarrhal and atrophic rhinitis [32].

Over the past 10 years, the incidence rate of this pathology has increased by an average of 11%, and now its incidence among the population of individual regions has increased to 16%, even up to 50%. In the United States alone, there are 19 million patients with vasomotor rhinitis, 26 million suffer from mixed forms [3]. In the Russian Federation, this pathology suffers from 10% to 20% of the population in various regions, and the trend towards an increase in the number of patients continues. The prevalence of this disease among children is 3.6 per 100 people.

In recent years, the circulation of patients with this pathology has increased more than 3 times. At the same time, the proportion of hospitalized patients with vasomotor rhinitis for surgical treatment increases annually by 1.5-2% [6,22,29].

Of particular interest is the occurrence of vasomotor rhinitis in pregnant women, which is a common pathology and is associated with changes in the hormonal status of pregnant women, develops in 5-32% of pregnant women. The authors found that the main clinical symptoms of vasomotor rhinitis in pregnant women are nasal congestion and paroxysmal sneezing (77.5%) [13]. Almost similar results were obtained and Lavrova O.V. et al. [21].

Studies have revealed that in newborns and in infancy in the intermediate layer of the CNS there were 2-3 rows of epithelial cells with rounded nuclei. In 1- and 2-periods of childhood, the number of rows of cells in the intermediate layer does not change, but the polymorphism of nuclear forms can be traced. In the adolescent and adolescent periods of ontogenesis, cell rows increase to 4-5 [1].

In children with vasomotor rhinitis, changes in autonomic homeostasis have been identified, which are of a different nature and depend on the type of initial vegetative tonus, autonomic reactivity and autonomic support of the child's activity. To achieve the results of treatment, they need to use complex therapy with an appropriate correction of autonomic disorders [17].

It is established that the causes of vasomotor rhinitis are general and local disorders of the autonomic nervous system, leading to changes in blood circulation in the vessels of the CNS. It is noted that the starting factor in the development of vasomotor rhinitis is often a respiratory viral infection. Non-specific triggers leading to the emergence of vegetative dysfunction may include tobacco smoke, strong odors, ozone, pollutants contained in the air and at work, alcohol intake, sudden changes in the temperature of inhaled air [16,20,22].

Cool air is the main non-specific trigger factor in idiopathic vasomotor rhinitis. The increased ozone content in the inhaled air leads to damage to the epithelium, increased vascular permeability, migration of leukocytes and mast cells to the SNV, stimulating the production of neuropeptides capable of participating in the formation of

nasal hyperreactivity, thus also in the pathogenesis of vasomotor rhinitis [12,15,32].

Anatomical and clinical-functional studies of MMNC in normal and in some forms of pathology revealed an intensive level of microcirculation and a high hemodynamic load of the vascular bed, the presence of a regulatory apparatus with a broad mediator profile, the complexity and variability of the mucociliary apparatus of endonasal structures, indicating the adaptability of the nasal cavity to the conditions of respiration in the environment [10,19,22].

Violation of nasal breathing in patients with vasomotor rhinitis worsens the quality of life of patients, affects sleep and performance, and is a factor in the development of complications such as sinusitis, otitis, a descending respiratory tract infection [19,28].

Revealed that vasomotor rhinitis often affects women older than 20 years with vascular dystonia. They are characterized by signs of vagotonia - acrocyanosis, bradycardia, low blood pressure, drowsiness, and neurasthenia. When examining the nasal cavity by the method of anterior rhinoscopy MMNC looks hyperemic, with a cyanotic tinge, the lower nasal conchae are increased in volume due to edema of MMNC, mucous discharge is present in the nasal cavity [14].

Diagnosis of vasomotor rhinitis presents certain difficulties, since similar symptoms are also observed in other diseases of the nose and paranasal sinuses — allergic rhinitis, acute rhinitis, acute rhinosinusitis, exacerbation of chronic rhinosinusitis, and others [2,19,22,26].

Some help in identifying a hyperergic reaction to nonspecific stimuli is provided by provocative tests with histamine, methacholine and cold air, but the application of these techniques in clinical practice is limited by the complexity of their implementation and the lack of standardization [24,32,33].

Methods for objective assessment of nasal breathing, such as acoustic rhinometry and anterior active rhinomanometry, are also non-specific and of secondary importance [2,6,15].

Currently, a large number of diagnostic methods for chronic hypertrophic and vasomotor rhinitis have been proposed. Most of the methods are insufficiently informative or are invasive, difficult to implement in everyday practice. In this regard, the search for the most objective, affordable, non-invasive methods for diagnosing various forms of chronic rhinitis continues [20].

One of the methods for the differential diagnosis of vasomotor rhinitis is an electrophoretic analysis of nasal secretion, the protein composition of which is different in patients and healthy individuals. A differential diagnosis of vasomotor rhinitis with sinusitis is recommended. The disease of the paranasal sinuses can be excluded by performing radiography or computed tomography [5,27].

Juravlev A.S. et al. [12] studied the peculiarities of the aerodynamic processes of the nasal cavity in normal and chronic vasomotor rhinitis. For research, the authors used a computer rhinomanometer for testing nasal breathing with a block of differential-flow characteristics (Patent of Ukraine

for Invention No. 91762, 2010). To study the aerodynamic processes of the nasal cavity, taking into account the peculiarities of the individual architectonics of the upper respiratory tract, the ratio of the total volume flows was taken for anterior active rhinomanometry and for inspiratory spirometry in each individual case. This study made it possible to objectively evaluate the functional state of the nasal cavity in patients with chronic vasomotor rhinitis.

Complex therapy of patients with vasomotor rhinitis is one of the urgent problems of practical otorhinolaryngology [7,8,11,23]. Treatment of patients is divided into conservative, which includes medical and physiotherapy treatment, and surgical treatment. The principles of treatment of sick children almost correspond to adults, but they have features associated with age.

Drug therapy of vasomotor rhinitis includes decongestants, intranasal glucocorticosteroids, H1-histamine receptor blockers. In addition, the spread of the introduction of drugs - novocaine, splenin, sclerosing solutions, viproxin in the mucous membrane of the lower turbinate [24,30,31].

Another effective method of conservative treatment of vasomotor rhinitis is the method of local hypothermia. A new device for local hypothermia proposed by the authors is equipped with an automatic control system for the coolant temperature, which completely controls the process of reaching the specified cooling mode and maintains this temperature level during the entire period of operation. The results of the combined treatment of patients turned out to be significantly better than with the appointment of only conservative therapy [8].

Abramovich S.G. [1] in his monograph reflected the current understanding of the use of therapeutic physical factors in otorhinolaryngology. Physiotherapeutic methods are described, the main pathogenetic mechanisms of their therapeutic action are indicated. The indications and contraindications for differentiated use are described.

Kryukov A.I. et al. [18] established the advantage of an integrated method (rehabilitation therapy aimed at normalizing the functioning of patients with the autonomic nervous system and local effects on the NETS by fluctuating current). The developed method of conservative treatment of vasomotor rhinitis in children had no contraindications to use, gave the most lasting positive functional result, recommended for use in outpatient and inpatient conditions.

For the treatment of vasomotor rhinitis in pregnant women, the laser "Alod-01-Alkom" (RF) was used, generating infrared radiation with a wavelength of 810 nm. The intervention consisted in conducting coagulating contact laser irradiation along the entire inferior shell of the nose with the output power of the monofilament light guide with a cut end to 7 W and its movement speed 1.0-1.5 cm / s. Pregnant women treated with this method were delivered on time, without complications [24].

Other authors for the treatment of patients with vasomotor rhinitis used 2 types of laser: holmium (Dornier Medialis Holmium: YAG - Ho: YAG - solid-state pulsed laser), a wavelength of 2.080 μm generates pulses of laser radiation

with a power of 25 W, frequency 3-10 Hz and a diode (Dornier Medialis D Lite Beam; Laserhead 10-01), wavelength 940 nm, pulse power 60 watts. Methods of laser exposure to the nasal conchas: intra mucous coagulation, surface coagulation and point coagulation [10].

In the absence of the effect of conservative treatment for vasomotor rhinitis, sparing surgical methods are recommended. These include electrocautery, electroplating, cryosurgical effects on the lower nasal concha's, their ultrasonic disintegration, submucosalvasotomy, submucosal vacuum vasotomy. In the last decade, high-tech surgical methods of treating this pathology — radiosurgery, laser destruction, argon-plasma coagulation — have become widespread [17,18,27].

According to some authors, the most frequent surgical intervention for vasomotor rhinitis is the disintegration of the nasal concha. It is performed mechanically, that is, with a scalpel and disintegrator, a laser beam, and ultrasound. The use of these technologies in the surgical treatment of patients with vasomotor rhinitis is not effective enough, complications and relapses of the disease are noted, requiring repeated surgical intervention [3].

For the surgical treatment of patients with vasomotor rhinitis patented a new method of surgical treatment of this pathology. The method made it possible to achieve a functionally resistant expansion of the common nasal passage by making a small incision with access to the bone skeleton of the inferior nasal concha, excision of excess tissue in the anterior end of the inferior nasal conch and fixing it with a suture to the anterior margin of the incision after vasotomy.

Other authors for the surgical treatment of vasomotor rhinitis were examined 106 patients with curvature of the nasal septum and vasomotor rhinitis. On the basis of the data obtained, a turboplastic technique has been developed taking into account the structural features of the lower turbinates. The effectiveness of the proposed method of surgical treatment of vasomotor rhinitis has been shown [22].

Kryukov A.I. et al. [18] compared the electrosurgical methods of the molecular resonance and radio wave range when performing a vasotomy to patients with vasomotor rhinitis. 64 patients were operated on with the help of objective research methods, the higher efficiency and safety of the method of radio wave surgery compared with the molecular resonance effects in patients was proved.

Cases of complications of laser surgery in the treatment of chronic vasomotor rhinitis have been described [20]. This fact indicates that when choosing a surgical treatment it is necessary to take into account many factors. The development and use of various methods of conservative and surgical treatment in the treatment of vasomotor rhinitis improved the effectiveness of treatment and the quality of life of patients, and also led to a decrease in the complications of this pathology among patients.

Currently, some variants of primary and secondary prevention of vasomotor rhinitis among the population have been proposed [16,19,29].

2. Conclusions

Analyzing and systematizing all the studied options, summarized data on the prevention of vasomotor rhinitis are given: the adequacy and timeliness of treatment for all forms of the common cold; avoidance of being in a dusty room, inhaling the evaporation of chemicals; the use of drugs for narrowing of the vessels no more than 3-5 days; Preventing contact with allergens and irritants; use of antiallergic drugs in cases of need; maintaining humidity in a residential and workroom at a normal level; disinfection of the nasal cavity with water and salt (sea) on returning home from the street and public places; control of psycho-emotional state; maintaining a healthy lifestyle.

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