AJPMHS GLOBAL RESEARCH NETWORK

AMERICAN Journal of Pediatric Medicine and Health Sciences
Volume 3, Issue 1, 2025 ISSN (E): 2993-2149

Improving the Treatment of Motor Rhinitis in School-Aged Children

Khamdamov Javlonbek
3rd year Master's student, Tashkent Pediatric Medical Institute

Abstract: Vasomotor rhinitis is one of the most common diseases in economically developed countries. In recent decades, among diseases of the upper respiratory tract, there has been an increase in the prevalence of vasomotor rhinitis in all age groups of the population. It is known that vasomotor rhinitis very often occurs in association with diseases of other organs and systems of the body. The problem of diagnosis and treatment of upper respiratory tract diseases in patients with endocrine pathology is one of the least studied areas of modern otolaryngology.

Keywords: Vasomotor, rhinitis, symptoms, hospital, treatment, chronic, disease, respiratory, inflammatory, rhinosinusitis.

Vasomotor rhinitis has a significant impact on patients' quality of life, causing symptoms such as nasal congestion, discharge, headaches, olfactory impairment, and breathing problems.

These symptoms can significantly worsen the social, work and emotional state of patients, reducing their ability to work and activity. It is important to note that the disease is often diagnosed late, and there is a high probability of incorrect diagnosis and treatment, which aggravates the problem.

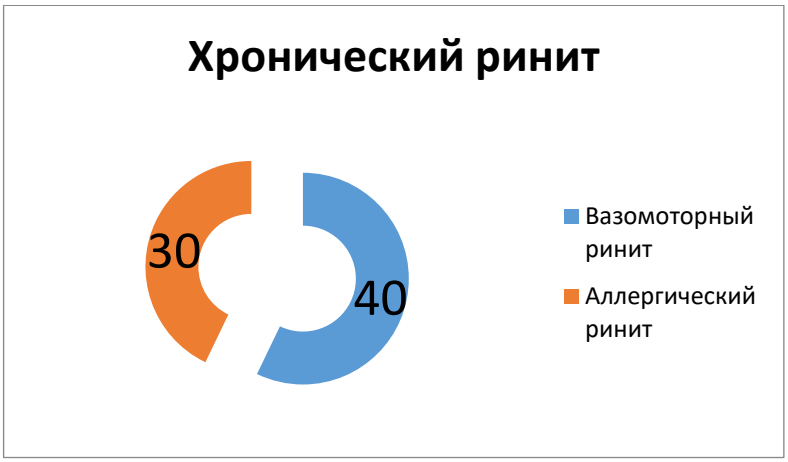
One of the reasons for the relevance of the topic is the insufficient study of the mechanisms of development of vasomotor rhinitis and its connections with various factors, such as climatic conditions, stress, inflammatory diseases and interaction with other respiratory diseases. In addition, existing treatment methods do not always give stable results, which requires the development of new approaches in the therapy and prevention of this disease.

In the context of modern medicine and the increasing incidence of upper respiratory tract diseases, research on vasomotor rhinitis is of significant importance for improving diagnostics, developing more effective treatment and prevention methods.

Research material.

A total of 70 children aged 7 to 18 years with chronic rhinitis were examined. Of these, 40 (57.1%) were children with vasomotor rhinitis (main group) , 30 (42.8%) children with allergic rhinitis (comparison group) (Diagram 1). After establishing the final diagnosis, we then studied children with vasomotor rhinitis.

Diagram 1. Distribution of patients with chronic rhinitis



All of them were undergoing inpatient treatment in the otolaryngology department of the TashPMI clinic and at the Happy base. life from 2022 to 2025. The average age of patients was 12.8±3.3 years. Among the examined subjects, there were 24 (34.2%) girls and 46 (65.7%) boys.

Based on the purpose and objectives of this work, patients were divided into two groups:

Group 1 (main) - 40 children with vasomotor rhinitis.

Group 2 (comparative) - 30 children with allergic rhinitis.

The diagnosis was made using the classification according to the WHO ARIA program (2012).

- mild form – minor clinical signs of the disease that do not interfere with daytime activity and/or sleep.
- moderate form – symptoms disrupt the patient's sleep, interfere with work, study, and sports; quality of life is significantly impaired.
- severe form - symptoms are so severe that the patient cannot study normally, play sports or leisure activities during the day and sleep at night if not treated. Of the 70 patients examined, 46 were male (65.7%) and 24 were female (34.2%). Age ranged from 7 to 18 years, with the majority of patients in both groups - 56 (80%), and the duration of the disease ranged from 1 to 8 years.

Table 1. Age and gender structure of examined children with vasomotor and allergic rhinitis

Survey groups	n	7-14 years old		15-18 years old	
		boys	girls	boys	girls
Main group (1 group)	40	13	6	14	*7*
Comparative group (2nd group)	30	10	6	9	*5*
Total	70	23	12	23	12

Thus, our study revealed that boys suffered from chronic rhinitis more often than girls.

Table 2. Distribution of patients depending on the severity of the disease

Patient groups	Vasomotor rhinitis	N =40	%
Main group	mild form	9	22.5
	moderate	24	40
	heavy	7	17.5
Patient groups	Allergic rhinitis	N = 30	%
Comparison group	mild form	11	36.6

	moderate	15	50.0
	heavy	4	13.4

No differences were found when distributing both groups according to severity.

Research methods.

In order to diagnose VR and rhinosinusitis, the anamnesis (hereditary predisposition, diet, previous illnesses, living and working conditions, allergic reactions), complaints (frequent runny nose with a protracted course, constantly difficult nasal breathing, sneezing, rhinorrhea , itching in the nose and throat), allergy examination data (total serum IgE), endoscopic picture of the nasal cavity (nature and amount of discharge, color of the mucous membrane, condition of the nasal turbinates), X-ray examination of the paranasal sinuses (contents, parietal edema of the mucous membrane, shadows of false cysts).

All patients underwent clinical and instrumental examination, including: collection of disease history; collection of child's life history; collection of parents' life history and mother's pregnancy and childbirth history; collection of child's history of diseases; otolaryngological examination; endoscopic examination of the nasal cavity and nasopharynx; radiography of the nasal cavity and nasopharynx; examination of the respiratory function of the nose; examination of the transport function of the nasal mucosa; examination of the olfactory function of the nose; examination of the state of the autonomic nervous system; follow-up observation. All patients were consulted and observed by cardiologists and neurologists.

To study the anamnestic data, we compiled a thematic map of the examination of the child and parents. Obtaining this information was necessary to clarify the causes that led to the development of VMR.

The subject card filled out for each patient included the following items: full name, age, gender, place of residence of the child; clinical diagnosis; patient's complaints at the time of examination and medical history; age and health of parents, their bad habits, occupational hazards of parents, heredity; allergy history; data on childhood infectious diseases and frequency of acute respiratory viral infections (their annual number); data on previously conducted treatment of VMR (conservative or surgical).

Anamnestic data of the examined persons indicated the presence of a hereditary predisposition to allergic diseases in 52.3% of patients. 86.2% of patients of them had intolerance to certain foods and medications.

The overwhelming majority of patients in the 2nd group complained of constant, large amounts of nasal discharge, difficulty breathing through the nose, sneezing, and itching in the nasal cavity and throat.

The diagnosis of VR was made based on the patient's complaints (general weakness, sweating, increased fatigue, memory impairment, emotional instability, headache, sleep disturbance, decreased appetite, difficulty breathing through the nose), anamnesis data and a typical rhinoscopic picture: the mucous membrane of the nasal cavity is cyanotic or spotted-cyanotic, the nasal turbinates (especially the lower ones) are edematous, enlarged in size; there is abundant mucous discharge in the nasal passages. When performing posterior rhinoscopy, hypertrophy of the posterior ends of the lower turbinates is often detected.

Nasal endoscopy.

In order for the procedure to be successful and informative, the doctor and parents must work together. Even before the child crosses the threshold of the office, the parents must explain to him the need for the procedure. It is necessary to tell the child that there will be no painful sensations if he follows the doctor's instructions.

A procedure such as pediatric nasopharyngeal endoscopy does not require special preparation. The child can eat and drink water without time restrictions.

During endoscopy of the child's nose and nasopharynx, a pediatric endoscope is used (fiber-optic equipment with a small camera attachment at the end of a tube with a diameter of 2.7 millimeters). Before the manipulations, the equipment is wiped with an antiseptic solution. After it dries, an anesthetic is applied to the endoscope.

The patient should be secured in a chair or in the arms of one of the parents. To insert the tube correctly, the head is tilted back. The camera is inserted into the nasal passage until the sinuses are reached. After their visual examination, the tube is advanced further into the nasopharynx. The image from the camera is magnified many times and displayed on the monitor. If the child behaves adequately, the procedure does not last longer than 3-7 minutes. During this time, the doctor can assess the condition of the mucous membrane, see polyps and other structures of the nasopharynx.

Rhinoscopic examination.

Rhinoscopy as a method of examination is very common in ENT practice and is performed on every patient who has visited an otolaryngologist with breathing problems and pathologies of the upper respiratory tract and paranasal sinuses.

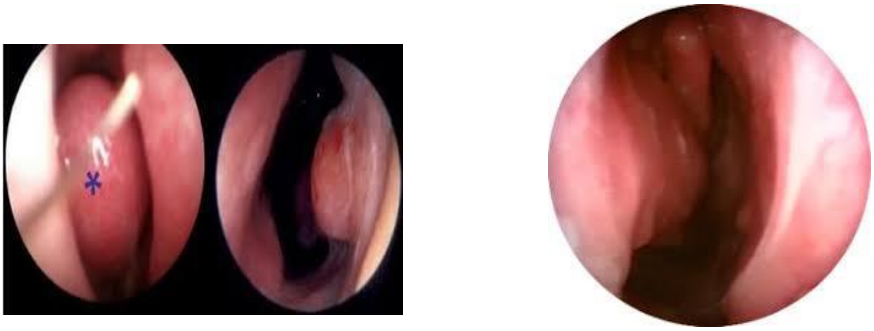


Figure 1

Endoscopic structure of the nasal cavity .

There are several types of rhinoscopy: anterior (direct, external), middle and posterior (indirect, retrograde, mirror). Different types of rhinoscopy are performed using different instruments and in different positions. Anterior rhinoscopy examines the bottom of the nasal cavity, two-thirds of the nasal septum and the anterior halves of the middle and lower turbinates. Middle rhinoscopy allows for examination of the middle turbinate and middle nasal passage with the olfactory slit. With posterior rhinoscopy, the posterior parts of the three nasal passages, the nasal septum and the nasopharynx are visible.

Figure 2. Performing a rhinoscopy

Along with standard clinical methods of examining ENT organs, special research methods were used in accordance with the objectives of the work.

Olfactory function. To study the olfactory function of the nose, four odorous substances (0.5% acetic acid solution, 70 o ethyl alcohol, valerian extract, tar) proposed as a test control by V. I. Voyachek were used . The degree of olfactory impairment was assessed by the loss of perception of these substances. Inability to perceive the smell of 0.5% acetic acid solution was assessed as olfactory impairment of the 1st degree; ethyl alcohol - olfactory impairment (hyposmia) of the 2nd degree; valerian tincture - olfactory impairment of the 3rd degree hyposmia ; tar - olfactory impairment of the 4th degree - anosmia.

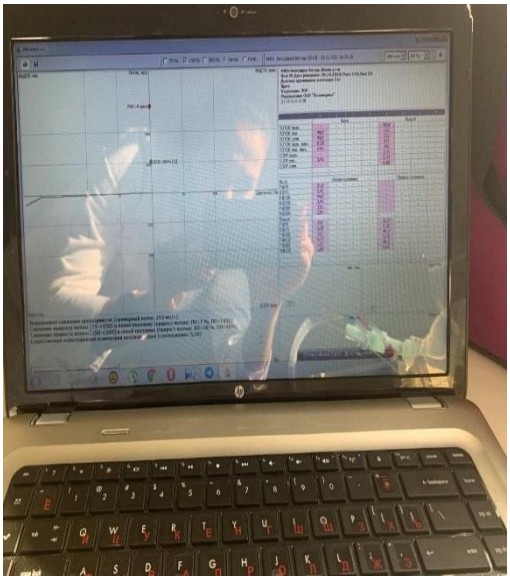
Rhinomanometry . With the help of a special device - a computer rhinomanometer (Rinolan , St. Petersburg) is used to **measure** and record the patient's breathing parameters using a diaphragm spiroceptor through a breathing mask or nasal olives. During the procedure, the pressure difference is also measured - between the pressure in the choana and the pressure inside the mask/olive.

In the closed method, flow measurements on the free side of the patient's nose are taken through a tightly fitting nasal mask. In any rhinomanometry method , to measure and evaluate flow and nasal resistance on both sides, the patient must take several breaths (5 full breaths are recommended) through the nose through special nasal olives that are selected according to the size of the patient's nostrils. The other side of the nose is then closed and the measurements are repeated on the other side. Typically, flow and nasal resistance are measured first on the right side, then on the left. The parameters and curves of each test are calculated and displayed on the screen as the study progresses.

The following designations are used to measure the parameters: - Flow R or Flow L - total nasal flow during inhalation and exhalation on the right (R) or left (L).

- Resist R or Resist L - total resistance during inhalation and exhalation right or left.
- Flow sum - total nasal flow from the right and left.

The measurement results are displayed in real time as a rhinogram , and after the measurement is completed, the results appear as a diagram. Rhinomanometry is performed , the pressure of the respiratory flow, in the form of a table of values and a histogram. Data processing is performed in the Rinolan program , and the obtained values and results are saved in the database. Any printer running on Windows OS , connected to the computer, can be used to print the research results. For easier evaluation of the measurement results, up to three graphical displays of the measurement can be reproduced simultaneously on the screen. Also, for easy evaluation, a graphical comparison of curves and a comparison of the obtained data in tables are performed. The processing of the calculation results is performed in the patented CAR data processing system (computer rhinomanometry). This process supports the rejection of measurement artifacts, which allows for more objective research results.



The smear method is a method of taking prints from the mucous membrane of the nasal cavity. The smears were taken with a cotton swab. with a swab soaked in sterile saline. Smears were usually taken from the area of the lower and middle nasal concha. Smears were applied to defatted slides using rotational movements without pressing. Smears were dried, fixed and stained according to Romanovsky- Giemsa . Microscopy was performed under immersion at a

magnification of 7 ocular, 90 objective. The total number of cells was counted. The number of neutrophils, lymphocytes and eosinophils was determined in nasocytograms . The specific gravity of each cell type was calculated as a percentage.

The temperature of the nasal mucosa was determined in the anterior region the end of the inferior nasal conchae using the TEM-60 electrothermometer

The normal value is -34.35±0.7 °C

X-ray examinations: MSCT, 3D

The condition of the paranasal sinuses was determined on survey radiographs in the naso -mental, anterior - axial and profile projections; 1/3 of the patients underwent computed tomography. and all patients underwent 3D paranasal sinusoscopy .

Additional laboratory and instrumental examination of patients was carried out in accordance with the approved list of examinations for outpatient treatment: clinical blood test with leukocyte formula. The absolute number of leukocytes in the clinical blood test was determined on the Hema hematology analyzer Screen 18 (Hospitex Diagnostics , Italy). Glasses with blood smears were stained using the Romanovsky- Giemsa method . The relative content of eosinophils in the leukocyte formula was calculated using a MIKMED 2 optical microscope (LMO, Russia).

Statistical processing of material.

All digital research material was subjected to variational statistical processing according to the methods of I.P. Ashmarin and A.A. Vorobyov (1986), V.K. Yuryev (1993) using a computer and the Student's criterion of statistical reliability of differences.

Conclusions

Thus, the study included all school-age patients who applied to the otolaryngology department for both outpatient and inpatient medical care and who met the inclusion and exclusion criteria. The reason for the visit was pathology of the nasal cavity, pharynx, larynx and ears .

All patients had their complaints, life history and disease history studied, otolaryngological examination and endoscopic examination were conducted. If there was a suspicion of pathology of the paranasal sinuses, patients underwent 3D , computed tomography of the paranasal sinuses.

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