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Clinical Course and Treatment of Patients with Atrophic Rhinitis After Covid-19

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The aim of the study: to improve the efficiency of diagnostics and complex treatment of atrophic rhinitis in patients who have had COVID-19.

Material and methods of the study: we observed 40 sick children aged 3 to 18 years with atrophic rhinitis who had had COVID-19 for the period from 2020 to 2023. The comparison group consisted of 20 sick children aged 3 to 18 years with atrophic rhinitis without COVID-19. Clinical and anamnestic research methods, general ENT examination, laboratory tests, saccharin test.

Results of the study: The main clinical signs of atrophic rhinitis in patients who have had COVID-19 are difficulty breathing through the nose (91%) and the formation of dry crusts (52%). The prolongation of the saccharin time in patients who have had COVID-19 to 17.47±0.135 minutes indicates profound morphological changes in the nasal mucosa. Atrophic rhinitis is a multifactorial disease caused by progressive degenerative changes in the nasal mucosa and receptors. In addition, atrophy of the mucous membrane can occur during the course of other chronic rhinitis. Thus, chronic catarrhal inflammation of the nasal mucosa under unfavorable conditions can gradually transform into an atrophic process with a decrease in the number of all cells, submucosal glands and secretions, which leads to significant dysfunction of the epithelium [1, 6,8]. Primary atrophic rhinitis is a chronic degenerative disease of the nasal mucosa of unknown cause. It leads to progressive atrophy of all components of the mucous membrane (epithelium, glands and blood vessels) and mainly affects the nasal cilia. Morphologically, it is manifested by the transformation of the epithelium from a single-row straight to a multilayer squamous epithelium with a complete absence of cilia and goblet cells, atrophy of the serous and mucous glands, chronic infiltration of the inner layer with granulations and scar formation. These destructive changes lead to thinning of the mucous membrane and a rapid decrease in its regenerative capacity. Some literary sources also report a decrease and decrease in the density of blood vessels, an increase in the thickness of elastic fibers associated with excessive proliferation of connective tissue, and an increase in the number of muscle fibers in the vessels, which is characteristic of obliterating arteritis [2, 4]. Viscous secretions from the remaining glands stagnate in the nasal cavity and subsequently dry out, forming crusts. The effect of an increased cross-section of the nasal cavity and an increased volume of air flow contributes to the progression of the degenerative process of the mucous membrane [9]. In recent years, coccal infections have been named as one of the causes of dry nose syndrome [2, 6, 8]. According to many authors, chronic rhinitis observed after COVID infection is associated with hyposmia and anosmia, which can be caused by various mechanisms - from direct viral damage to the chemosensory system to cranial neuropathy [2,5]. Persistent olfactory disorders are observed in 7% of patients with bovine disease [3,11]. Some authors point to vascular dysfunction of the nasal mucosa and hypoxia as the main causes of chronic subatrophic rhinitis and olfactory disorders after COVID [10].

Analysis of the results of the studies shows that vascular and neurogenic mechanisms are involved in the formation of chronic rhinitis after ovariolithiasis with the help of a secondary bacterial infection [7,12].

Objective of the study: to improve the effectiveness of diagnostics and comprehensive treatment of atrophic rhinitis in patients who have had COVID-19.

Research objectives:

1. To identify the frequency of atrophic rhinitis in patients who have had COVID-19.

2. To assess the degree of damage to the nasal cavity in patients who have had COVID-19 based on the saccharin test.

Research material

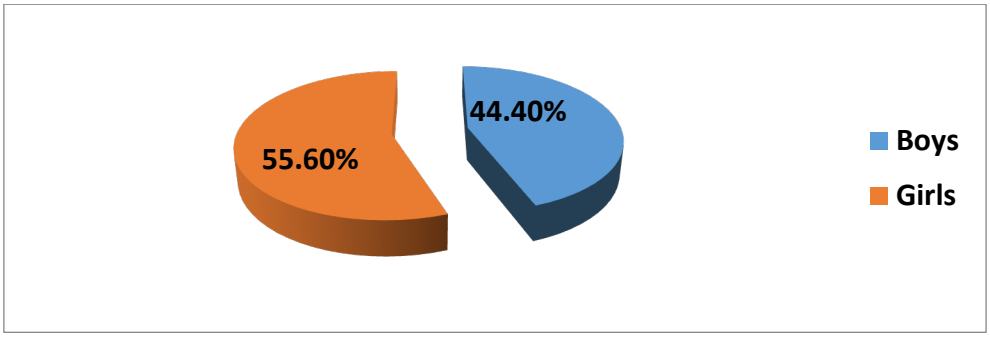
We observed 40 sick children aged 3 to 18 years with atrophic rhinitis who had had COVID-19 from 2020 to 2023.

The comparison group consisted of 20 sick children aged 3 to 18 years with atrophic rhinitis without COVID-19

Research methods: Clinical and anamnestic research methods, general ENT examination, laboratory tests, saccharin test.

Results of the study: The study included 40 patients diagnosed with atrophic rhinitis aged 3 to 18 years, of which 22 were girls (55.6%) and 18 were boys (44.4%).

Diagram 1. Distribution of the studied patients by gender.



The diagnosis of atrophic rhinitis was made based on patient complaints, anamnesis data, rhinoscopic picture and endoscopic examination. All patients underwent radiography of the paranasal sinuses (PNS), a smear was taken from the pharynx for Abel cells and Klebsiella ozaenae. Thus, in this study it was determined that atrophic rhinitis was suffered from in 61.6% of cases girls compared to 38.3% of cases boys. The incidence of atrophic rhinitis was higher in 53.3% of cases in children aged 10-18 years

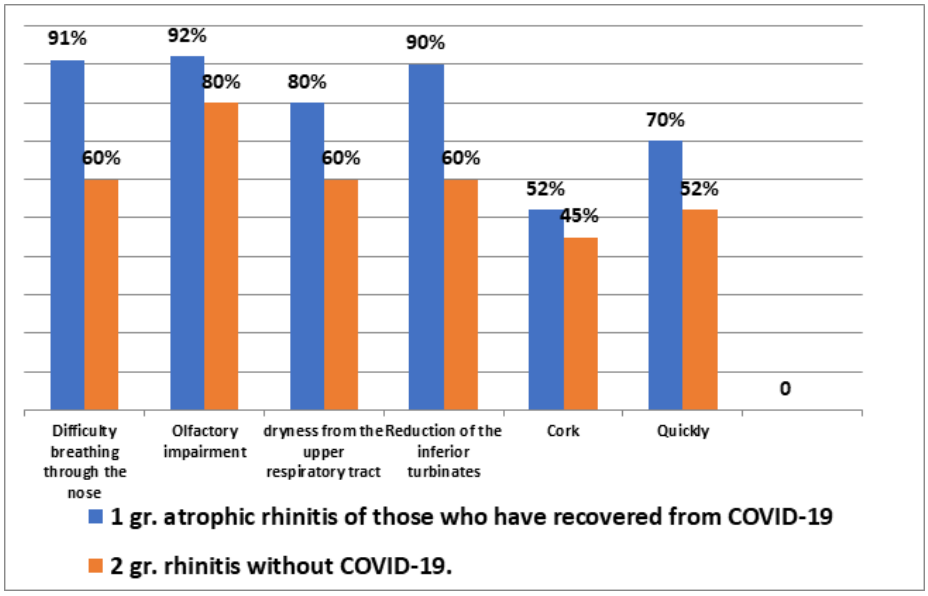
Table 1. Distribution of the studied patients by gender and age

Name of the group of patients	Reason for inclusion in the group	Number of patients				
		Total	By gender		By age	
			girls	boys	3-9 years	10-18 years
Main group	Atrophic rhinitis	40	23 (57,5%)	17 (42,5%)	24	16
Comparison group	Healthy children	20	11(60%)	9 (40%)	4	16
Total		60	34(56,5%)	23 (43,3%)	28 (46,6%)	32 (53,3%)

An analysis of the clinical manifestations of atrophic rhinitis in the study groups showed that the above symptoms of atrophic rhinitis in adults and children are characteristic of both types of the disease - primary and secondary. People complain of dryness and itching in the nose, the formation of crusts of an unpleasant color and odor. Removal of crusts is accompanied by pain

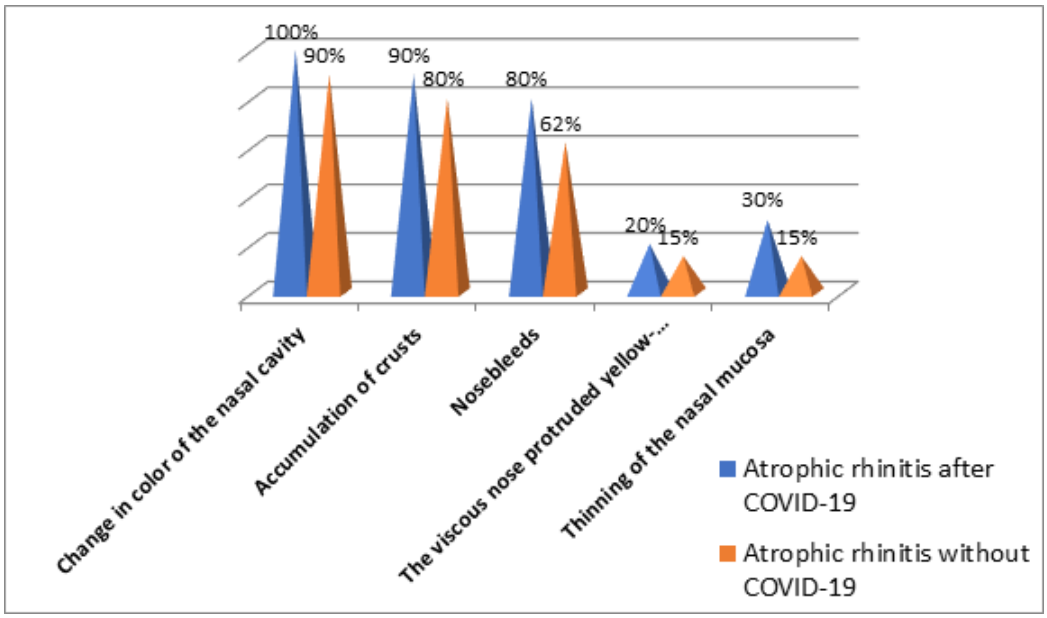
and injury to the mucous membrane. Thus, the main clinical manifestations of chronic atrophic rhinitis were determined in both study groups and included (91% versus 61%) difficulty breathing (91% versus 80%), olfactory impairment, a feeling of dryness in the nasal cavity, itching and abundant formation of dry crusts, which are found not only in the anterior, but also in the posterior part of the nasal cavity. A decrease in the sense of smell up to complete disappearance with a frequency of 92% was determined in the study group in patients who had COVID-19.

Diagram 2. Comparative analysis of clinical manifestations of rhinitis in study groups.



Signs such as periodic bleeding, difficulty in nasal breathing, purulent, viscous discharge drying into yellowish-gray crusts were also noted with a higher frequency in the 1st study group. The crusts can itch, which is why the patient, trying to remove them, damages the mucous membrane and thus provokes bleeding, ulceration of the nasal mucosa, which subsequently contributes to the development of perforation of the nasal septum. Due to persistent impairment of nasal breathing, as well as recurring episodes of nosebleeds, patients periodically experience weakness, anemia, panic attacks. In this case, dry nose is the most common and dominant symptom of atrophic rhinitis.

Diagram 3.



Rhinoscopic picture on admission.

The rhinoscopic picture in this group was characterized by swelling and pallor of the mucous membrane of the nasal cavity, bluish (blue) spots on the lower nasal conchae. All patients in this group periodically used nasal drops containing decongestants. No other medications were used at the time of contacting the doctor.

Complex general and local conservative therapy was used. To remove crusts, the nasal cavity was systematically irrigated or washed with an isotonic solution of sodium chloride (saline) with the addition of iodine 1-2 times a day (6-8 drops of 10% alcohol iodine solution per 200 ml of solution). Complex therapy was added (apricot oil). Apricot oil contains oleic acid, which allows the oil to be well absorbed, retains moisture, and enhances the penetration of other active components into the stratum corneum of the skin. 2-3 drops in the nose 3 times a day for a month. Apricot oil, which is part of the preparation, is a standardized inert oil, which is widely used in cosmetology as a preparation for skin and hair care. Being an effective moisturizing substance, it helps to avoid skin dehydration and reduces the severity of transepidermal water loss. In addition, it is used to reduce the formation of crusts and peeling

The transport function of the nasal cavity in children is easier to check with saccharin. The degree of damage to the nasal cavity in patients with COVID-19 based on the saccharin test was as follows: When assessing the transport function of the nasal mucosa (initial indicators (before treatment) in group 1 were 17.47 ± 0.135 minutes, in group 2 - 15.42 ± 0.117 minutes), it was noted that by the end of the treatment, the time of the appearance of a sweet sensation from saccharin decreased to 9.34 ± 0.141 minutes in group 1 and to 10.11 ± 0.138 minutes in group 2, with a physiological norm of 7.54 ± 0.34 minutes.

Table 2. Change in the indicator "Time of the saccharin test", minutes, in both groups

Group	**Average**	**Standard Error of the Mean**
Study group 1. Atrophic rhinitis in patients with COVID-19	17,47±0,135 minute	0,18
Study group 2. Atrophic rhinitis without COVID-19	15,42±0,11 minute	0,20

Based on the above, the following conclusions can be made:

1. The main clinical signs of atrophic rhinitis in patients with COVID-19 are difficulty breathing through the nose (91%) and the formation of dry crusts (52%)

2. An increase in saccharin time in patients with COVID-19 to 17.47±0.135 minutes indicates profound morphological changes in the nasal mucosa.

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