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Optimization of the Complex Treatment of Acute Rhinosinusitis

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Abstract The aim of the study was to study the effectiveness of the use of mucolytic drugs in the complex treatment of patients with acute rhinosinusitis. The study material consisted of 64 patients with acute rhinosinusitis who were hospitalized in the ENT department of the 3rd clinic of the Tashkent Medical Academy. Thus, it follows that the inclusion of Sinupret in the complex treatment of patients with acute rhinosinusitis significantly increases its effectiveness, contributing to a faster improvement in patients' well-being, shortening the time needed to normalize the rhinoscopic picture and sanitizing the sinuses, and reducing the frequency of medical manipulations and surgical interventions.

Keywords Acute rhinosinusitis, Conservative treatment, Mucolitis, Mucociliary clearance

1. Introduction

Rhinosinusitis is a significant health problem worldwide. It is an infection of the nasal passages and the paranasal sinuses [1,6,9]. The term “sinusitis” typically carries different meaning for the patient and the primary care physician. Patients commonly attribute symptoms such as headache, facial pain, nasal congestion, or rhinorrhoea to “sinus trouble” when in fact it may be due to various other reasons. Primary care physicians often tend to think of sinusitis as an acute bacterial infection, hence antibiotics are prescribed in 92% of patients in the UK and 85–98% of sinusitis patients in the US. In 2003, the number of medical prescriptions for acute bacterial sinusitis was over 7,6 million in Germany. In France, around 7% of all antibiotics are prescribed to treat suspected acute bacterial sinusitis. The estimated annual cost of treatment in the UK is £10 million (€14,7 million, US$20 million). In 1996, the total cost of prescription and non‐prescription medications used for the treatment of sinusitis in the US was estimated at $3,39 billion (€2,5 billion, £1,7 billion). Rhinosinusitis has accounted for 12 to 17 million annual visits to physicians and for 12% of antibiotics prescribed to adults in the US, making it one of the 10 most common conditions to be treated in ambulatory practice [2,12].

The enormous use of antibiotics has a financial impact on the health services. More importantly, it can contribute to the emergence and spread of antibiotic‐resistant bacteria. It is therefore important to appropriately identify and manage this common condition. This article provides an evidence based update on the current management of acute rhinosinusitis [3,5].

The paranasal sinuses are lined with pseudo‐stratified columnar epithelium, which is continuous with the lining of the nasal cavity. This epithelium contains a number of mucus‐producing goblet cells. Under physiologic conditions the sinuses are normally sterile. Their function depends on regular transport of the mucus layer from paranasal sinuses through their natural openings into a common area, known as the infundibulum, in the middle meatus of the nasal cavity. This area is the focal point of sinus drainage and is known as the osteomeatal complex. It is situated in the lateral wall of the nose. From the nasal cavity the mucus then drains into the oropharynx [4,10].

Acute rhinosinusitis starts as a viral infection of the nose resulting in inflammation and/or viral infection of the adjoining sinuses. There may be development of negative atmospheric pressure within the sinus cavities and a decrease in oxygen partial pressure. There is also excessive mucus production with or without transudation of plasma. This results in malfunction or complete cessation of movement of the cilia lining the sinuses leading to stasis of mucus and occlusion of the osteomeatal complex. This creates an environment within the sinuses that supports the growth of pathogenic organisms. Therefore, the development of rhinosinusitis is mainly attributed to blockage of the osteomeatal complex [5,7,12].

A wide range of factors predispose to obstruction and decreased ciliary function of the sinuses. These can be viral or non‐viral in origin. The most common cause of acute rhinosinusitis is a viral upper respiratory infection. Approximately 9 out of 10 patients who have viral upper respiratory tract infections have involvement of the adjacent

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sinuses. Up to 0,5% of upper respiratory infections in adults develop into documented sinusitis. However, only 5–10% of these patients have bacterial superinfection requiring antimicrobial treatment [2,7,8].

Although sinusitis is considered as rhinogenous in origin, dental infections are vital predisposing factors to be considered, as they can account for approximately 10–12% of cases of acute maxillary sinusitis. An odontogenic source should be considered in patients with symptoms of maxillary sinusitis who have a positive history for odontogenic infection or dentoalveolar surgery. Review of the literature suggests that many cases of recurrent acute sinusitis are due to secondary rhinogenous bacterial colonisation of antral mucosa that have been weakened and degenerated by chronic dental infection/inflammation [3,6,11].

The aim of the study was to study the effectiveness of the use of mucolytic drugs in the complex treatment of patients with acute rhinosinusitis.

2. Materials and Methods

The study material consisted of 64 patients with acute rhinosinusitis who were hospitalized in the ENT department of the 3rd clinic of the Tashkent Medical Academy. All patients, in accordance with the applied method of treatment, were divided into the main and control groups. 23 patients of the main group took Sinupret as part of a complex treatment. 41 patients of the control group received complex therapy that did not include Sinupret. All patients received complex treatment: vasoconstrictor nasal drops. All patients with acute rhinosinusitis received broad-spectrum antibiotics per os (azithromycin for at least 7 days). In addition, all patients underwent puncture of the maxillary sinuses and lavage of the paranasal sinuses with warm saline by moving. After suctioning saline from the inflamed sinus into the opposite half of the nose, we poured a solution of the prepared antibiotic of the cephalosporin series (cefazolin, cefotaxime, ceftriaxone, etc.) in an amount of 10,0 ml with the addition of 1 ml of dexamethasone. The penetration of the medicinal solution into the paranasal sinuses occurred at the time of the change from negative pressure to atmospheric. In case of purulent secretion in the maxillary sinus, patients with maxillary ethmoiditis, after washing the sinus by the method of moving, underwent puncture, followed by washing and the introduction of antibacterial drugs. The drug Sinupret in patients of the main group was administered orally, 50 drops 3 times/day. The medicinal effect of this drug is due to the herbal components that make up its composition. Sinupret has a pronounced secretolytic, anti-inflammatory, antiviral and immunomodulatory effect.

The results of the complex treatment of patients with rhinosinusitis were assessed by the dynamics of patients' complaints, changes in the rhinoscopic picture and the state of the transport function of the ciliated epithelium of the nasal mucosa, as well as by the data of X-ray or CT-examination. When analyzing the patient's complaints, attention was paid to pain, the nature of the discharge, difficulty in nasal breathing, a decrease in smell, the presence of fever, with rhinoscopy - to swelling and hyperemia of the nasal mucosa, the degree of narrowing of the nasal passages and the presence of discharge in them. The transport function of the ciliated epithelium of the nasal mucosa was investigated on the 1st, 3rd, 5th and 7th days from the start of treatment. The effectiveness of treatment was assessed according to the following criteria: excellent - quick relief of subjective and objective symptoms of the disease and sanitation of the local focus of inflammation, restoration of physiological functions of the nose, recovery period - within 5-6 days; good - positive dynamics of the course of the disease, recovery period - 7-8 days; satisfactory - relief of symptoms of the disease, recovery period - 9-10 days; low - delayed recovery and complete reorganization of the local focus of inflammation, recovery period - more than 10 days, relapse during the follow-up period (1,5 years or more); unsatisfactory - the absence of pronounced changes in the course of the disease, a short-term improvement in the condition or a relapse of the disease within 1 month after recovery, the need for surgical treatment if conservative therapy is ineffective.

3. Research Results and Their Discussion

When analyzing the initial state of patients with acute sinusitis, it was found that in the main subgroup, pain in the paranasal sinus area before treatment was in 26,87% of patients, in the control group - in 25,37%. Also, the frequency of complaints of nasal and nasopharyngeal discharge did not differ (1st and 3rd subgroups – 28,8% and 25%, respectively). Already after the 1st day of complex conservative treatment in 58,2% of patients of the main subgroup who initially experienced pain, a decrease in pain was noted, in 10,5% of patients - its disappearance, and in 8,7% of patients the intensity of pain changed (from constant it became periodic). In 50,8% of patients with recurrent pain by 3 days. it disappeared, and in 23,9% it sharply decreased in duration and frequency.

The disappearance of pain and normalization of body temperature in patients of the main subgroup who received Sinupret occurred significantly earlier than in patients of the control subgroup. Also, statistically significantly faster in patients of the main group with acute rhinosinusitis, discharge from the nose and nasopharynx stopped, nasal breathing and sense of smell were restored ($p \square 0,01$). In patients of the main group, on average, the pain disappeared in 2,56±0,17 days, the discharge stopped in 3,93±0,32 days, nasal breathing recovered on 3,58±0,43 days, the sense of smell returned to normal 4,43±0, 36 days, the temperature decreased in 2,27±0,19 days. In the patients of the control group, on average, the pain disappeared at 4,23±0,25 days, the discharge stopped at 5,57±0,17 days, nasal breathing recovered on 5,73±0,28 days, the sense of smell returned to

normal at 6,29±0,57 days, the temperature decreased in 3,8±0,21 days.

When analyzing the dynamics of treatment of patients with acute rhinosinusitis, it was found that the normalization of the rhinoscopic picture and sanitation of the paranasal sinuses in patients receiving Sinupret were observed on average for 2–3 days. earlier than in patients of the control group. After the start of treatment, complete sanitation of the paranasal sinuses also occurred earlier in patients of the main subgroup. In patients of the main group, the normalization of the rhinoscopic picture, on average, occurred at 7,48±0,26 days, sanitation of the sinuses at 7,04±0,3, since in patients of the control group, on average, it occurred at 10,52±0,25 days, sanitation of sinuses at 9,48±0,23. These differences were statistically significant ($p<0,001$). At the same time, patients of the main subgroup underwent an average of 4,04±0,24 manipulations, patients of the control subgroup – 5,10±0,34.

Particular attention was paid to the effect of Sinupret on the transport function of the ciliated epithelium in the compared clinical subgroups on days 1, 3, 5 and 7. from the start of treatment. Before the start of treatment (1st day), the data on the transport function of the ciliated epithelium were approximately the same in all subgroups. The results of the study of the transport function of the ciliated epithelium of patients with acute rhinosinusitis in the main group on the 1st day were 28,9±0,53 min, on the 3rd day 26,17±0,54 min, on the 5th day 23,17±0,61 min, on the 7th day 19,6±0,42 min, since the patients of the control group on the 1st day were 29,14±0,53 min, on the 3rd day 27,9±0,53 min, on the 5th day 26,52±0,51 min, on 7th day 24,86±0,49 min.

Against the background of the treatment, all patients with acute rhinosinusitis showed an improvement in the transport function of the ciliated epithelium. In patients receiving Sinupret, significantly better indicators of the normalization of the transport function of the ciliated epithelium were recorded in comparison with the data of patients in the control subgroup. In patients of the control subgroup, the transport function of the ciliated epithelium remained slower by the 7th day.

After analyzing the results of treatment in patients with acute rhinosinusitis, we came to the conclusion that in all patients of the main subgroup, the treatment was quite effective (excellent and good efficacy prevailed) compared to patients in the control subgroup. At the same time, in patients of the main group, the effectiveness of treatment was excellent in 10 (43,48%), good in 9 (39,13%), satisfactory in 4 (17,39%), in patients of the control group it was good in 3 (14,29%), satisfactory 12 (57,14%), low in 6 (28,57%) patients. Thus, based on the results of the analysis, it can be concluded that the generally accepted complex treatment of patients with acute rhinosinusitis without the inclusion of Sinupret is less effective than with the use of this drug.

Thus, **it follows** that the inclusion of Sinupret in the complex treatment of patients with acute rhinosinusitis significantly increases its effectiveness, contributing to a faster improvement in patients' well-being, shortening the time needed to normalize the rhinoscopic picture and sanitizing the sinuses, and reducing the frequency of medical manipulations and surgical interventions.

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