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THE USE OF "SINUPRET" WITH ANTIBACTERIAL DRUGS IN THE COMPLEX THERAPY OF ACUTE AND CHRONIC RHINOSINUSITIS IN PATIENTS WITH CEREBRAL PALSY

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Annotation

Complex treatment of paranasal sinusitis that occurs in patients with infantile cerebral palsy plays an important role in the rehabilitation and improvement of the quality of life of this group of patients. The mucociliary transport function of the nasal mucosa in patients with paranasal sinusitis with infantile cerebral palsy was studied and the clinical efficacy of the drug was determined by adding a mucoregular drug (sinupter drops) to the complex treatment. The functional state of the nasal mucosa was studied in 65 patients with infantile cerebral palsy aged 3 to 16 years with paranasal sinusitis. All patients were divided into 2 groups: main (44 patients), control (21 patients). Patients of the main group, in addition to complex treatment, received synupret drops. The results of our study confirmed that the combined use of antibiotic therapy in the treatment of paranasal sinusitis in childhood against the background of cerebral palsy with the addition of synupret to symptomatic treatment accelerates the transport activity of the nasal mucosa and leads to the disappearance of symptoms.

Keywords: cerebral palsy since childhood, paranasal sinusitis, mucociliary transport, sinuperet.

Introduction

Cerebral palsy (cerebral palsy) is a group of stable disorders of motor development and posture maintenance that lead to limited functional activity and motor disorders caused by non-progressive damage or abnormality of the developing brain in a fetus or newborn child [2,3,6]. Cerebral palsy is the most common neurological pathology leading to disability in patients under the age of 18 years old.

Ideas about cerebral palsy as a predominantly motor pathology have changed significantly over the past decades, and currently the disease is considered complex, affecting many brain systems, which necessitates a methodological

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study of this form of pathology in order to determine the features of the course of the disease against the background of treatment and rehabilitation of patients[6]. Many issues of medical support for children with cerebral palsy remain unresolved. Until now, patients with cerebral palsy are vaccinated according to an individual calendar of preventive vaccinations in a limited amount or are not vaccinated at all. This circumstance creates significant risks for the disease of infectious diseases. Multidisciplinary and integrated approach are the basis of modern ideas about the problem of cerebral palsy in children, adolescents and adult patients. Therefore, all the latest achievements of modern clinical medicine should be implemented as much as possible into the practice of daily activities of specialists of various medical specialties involved in helping patients suffering from this frequent type of neurological pathology [2,3,4,6].

E.I. Yulish et al. (2008) it is believed that intrauterine infections contribute to the development of hypoxia and asphyxia, increase the frequency of acute respiratory infections in the first year of life, cause immunogenesis disorders. Their studies revealed a decrease in the number of major subpopulations. CD3, CD4, CD8, CD19, CD56 lymphocytes, with an increase in the number of CD95 - the level of apoptosis marker in children who have suffered severe asphyxia. The relationship between immunological indicators and the frequency of acute respiratory viral diseases allowed these children to be attributed to the group of frequently and long-term ill. Children with cerebral palsy have reduced adaptive resources, primarily due to organic damage to the regulatory structures of the central nervous system - hypothalamus, hippocampus, cerebral cortex [2,3,4,7]..

According to Kaladze N.N. et al. (2014), among 54 examined children, acute respiratory diseases or exacerbations of chronic foci of infection developed in 31 (57%) children: exacerbations of chronic infections of ENT organs prevailed in 18 (58% of patients).

In children with cerebral palsy, the mechanisms of immune defense reactions are disrupted due to organic damage to the central immunocompetent regulatory structures of the brain, early, most likely, intrauterine activation of immature immunological reactions against the background of intrauterine infection, the development of secondary weakness of immune mechanisms due to frequent infectious diseases.

The transport function of the ciliated epithelium is one of the most important functions of the nasal cavity and paranasal sinuses. Mucus transport depends on two main factors - the activity of the cilia of the ciliated epithelium and the

production of nasal secretions (S.Z.Piskunov, 2002). Under normal conditions, nasal secretions are a product of the activity of glands and goblet cells. The ciliated apparatus of the scintillating cells is located in the mucus covering the surface of the mucous membrane and forms together with it a mucociliary transport system, which, due to the strict rhythmicity of the scintillating movements, ensures the movement of mucosal secretion products and various foreign particles and microorganisms settling on its surface towards the nasopharynx, thus carrying out constant purification.

Inflammation in the respiratory tract usually occurs with a violation of vascular permeability, which in turn leads to a change in the nature of secretion. Pathologically altered secret is one of the key problems of chronic inflammatory diseases of the nose and paranasal sinuses.

Currently, the mechanisms of secret formation are underestimated by doctors, and a simplified view of this process significantly narrows the range of adequate mucoregulatory drugs.

Secretory formation, as well as the mechanisms of its regulation, are currently not fully understood. The secret of the respiratory tract is an integral part of the so-called mucociliary system, which is the first line of human protection from harmful environmental influences [1,2,3,].).

The protective function of the ciliated epithelium largely depends on the quantitative and qualitative parameters of mucus. With normal rheological characteristics of mucus, the transport time of inhaled particles deposited on the mucous membrane to the nasopharynx is on average 10-20 minutes. The optimal ratio of the nature of mucus and the functional ability of the ciliated epithelium prevents colonization of constantly entering microflora.

Normally, the secret is constantly produced by goblet cells, which are single-celled glands of the mesocrine type.

The normal ratio of goblet-shaped and ciliated cells is on average 1:10, and goblet-shaped cells are mainly concentrated in the area of the nasal shells.

The secret of the nasal cavity and paranasal sinuses is formed in the same way. The entire secret produced by goblet cells with a thickness of about 8-10 microns is distributed into two layers. The surface layer is a dense gel–like colloidal film and a near-wall liquid preciliary sol layer in which the cilia are immersed.

Mucus in the physicochemical aspect is a complex structure of a semi-solid gel, whose high-molecular filamentous polymers form a three-dimensional grid with the help of sulfur disulfide bridges, hydrogen bonds, as well as the so-called Van

der Waals forces or forces of intermolecular interaction. Chemically, the secret, consisting of 95% water, is an alkaline proteid, which at a pH of 7.5-7.6 turns from sol into gel. Such physical characteristics give nasal secretions the properties of solids (elasticity) and liquids (viscosity, fluidity) [1,2,3,7,8]..

According to the indicator of mucociliary transport, it is possible to judge the functional state of the mucous membrane, therefore, tests to determine the mucociliary clearance of the nasal mucosa and paranasal odors are considered the most objective research methods. In our work, we were once again convinced of this by obtaining a correlation between the results of a morphological study and the indicators of mucociliary transport of the mucous membrane.

There are quite a lot of methods for studying the transport function of the ciliated epithelium, but currently many researchers recommend the saccharin test as the simplest and most informative method for studying mucociliary transport (M.S.Milman et al., 1989; Portenko G.M., 1989). We agree with the opinion of the authors and in our opinion the saccharin test is really very convenient, since it does not involve significant monetary costs, it is easy to use, therefore it should be widely used in clinical practice [1,2,3,8,10].

Dysfunctions in the mucociliary transport system are quite difficult to diagnose, and it is even more difficult to establish whether they are really causally related to the recurrence of the process. In some individuals, even a sharp slowdown in mucociliary transport in the nasal cavity, paranasal sinuses and in the tracheobronchial tree does not manifest itself clinically in any way. Nevertheless, according to modern concepts, patients with chronic sinusitis usually show both a slowdown in mucociliary transport and a decrease in the frequency of beating of the cilia. A successful operation usually normalizes the speed of mucociliary transport without affecting the frequency of beating of the cilia. Thus, the study of the speed of mucociliary transport in complex diagnostic situations, especially in the presence of concomitant chronic bronchopulmonary pathology, can clarify one of the probable causes of rhinosinusitis [2,3,9,11].

For this purpose, we used a standard saccharin test, the method of which is as follows. A piece of saccharin with a diameter of about 1 mm was applied to the mucous membrane of the lower nasal conch, retreating about 1 cm from its anterior end, and a stopwatch was used to mark the time until the examinee felt a sweet taste in his mouth. During the study, the patient should not sneeze, cough, blow his nose and force nasal breathing and should make about one swallowing movement per minute. Before the study, it is impossible to anemize the mucous

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membrane and inject any medications into the nasal cavity. Normal indicators of saccharin time can vary widely: from 5 to 30 minutes. If, after an hour, the subject did not notice the appearance of a sweet taste in his mouth, we repeated the study again and checked whether he was able to taste saccharin at all.

If the saccharin test indicated a significant slowdown in mucociliary transport, then to confirm the diagnosis of mucociliary dysfunction, we used a method based on endoscopic examination of the promotion of methylene blue or other dyes. In the case of a sharp slowdown in mucociliary transport, a strong staining of the mucous membrane at the site of the mark could be seen even with anterior rhinoscopy. If repeated tests confirm the immobility of the marks inserted into the nasal cavity, then it can be definitively stated that this patient has a violation of mucus transport, although only microscopy of biopsies of the nasal mucosa can establish the presence of structural pathology of the cilia.

To compare the obtained indicators, we examined 15 people who did not suffer from pathology of the nasal cavity and paranasal sinuses. As a result, in healthy individuals, the time from the moment of application of saccharin to the appearance of a sweet taste in the mouth averaged 11.5 ± 0.75 minutes.

All examined patients in the study of the functional features of the nasal mucosa were conditionally divided into groups depending on the prevalence and form of the inflammatory process.

In total, we identified 3 groups of patients depending on the localization of acute or chronic inflammatory process. The first group is ethmoiditis, the second group is sinusitis and the third group ishemisinusitis or pansinusitis.

As a result of the study in patients with acute rhinosinusitis of the first group, which included patients with acute ethmoiditis, the average index of mucociliary transport of the nasal cavity averaged 26.2 ± 0.61 minutes.

In patients with acute rhinosinusitis of the second group, which included patients with acute sinusitis, the average index of mucociliary transport of the nasal cavity averaged 27.1 ± 0.64 minutes.

In patients with acute rhinosinusitis of the third group, which included patients with acute hemisinusitis and pansinusitis, the average index of mucociliary transport of the nasal cavity averaged 28.3 ± 0.67 minutes.

As a result of the study in patients with chronic rhinosinusitis of the first group, which included patients with chronic ethmoiditis, the average index of mucociliary transport of the nasal cavity averaged 27.7 ± 0.65 minutes.

In patients with chronic rhinosinusitis of the second group, which included patients with chronic sinusitis, the average index of mucociliary transport of the nasal cavity averaged 28.1± 0.67 minutes.

In patients with chronic rhinosinusitis of the third group, which included patients with chronic hemisinusitis and pansinusitis, the average index of mucociliary transport of the nasal cavity averaged 30.4± 0.69 minutes.

The data obtained by us indicate a violation of the transport function of the nasal mucosa in patients with chronic sinusitis. Moreover, the degree of violation is usually directly dependent on the volume and form of the inflammatory process.

In order to study the clinical efficacy and safety of the use of the drug «Sinupret» extract in the complex therapy of rhinosinusitis in patients with cerebral palsy, we conducted a study to study changes in the dynamics of the speed of mucociliary transport during treatment.

Mucoactive drugs can affect both sectorial activity and the secret itself. Depending on the mechanism of action, mucoactive drugs are divided into substances of direct action on the secret (mucolytics, mucohydrants) and drugs of indirect action (mucoregulators, secretomotor, secretolytics).

The main strategy for the treatment of chronic sinusitis is based on improving ventilation and drainage of the paranasal sinuses. Thus, it is important in the treatment of these diseases, on the one hand, softening and dilution of viscous thick secretions, and on the other hand, improving the process of effective movement of secretions by activating the motility of the atrial epithelium of the nasal cavity and paranasal sinuses.

Mucokinetics have a secretomotor effect, reflexively acting due to irritating effects on stomach receptors and apparently reflexively affecting mucociliary transport. A number of secretomotor drugs of this group, along with a mucokinetic effect, have a secretolytic effect, stimulating rhinobronchial secretion, which leads to dilution of the secretion of the upper respiratory tract. Clinical manifestations of pathophysiological processes of most inflammatory diseases of the paranasal sinuses, especially with a tendency to chronization, are mainly associated with problems in mucoregulation.

Recently, phytopreparations have been widely used in the treatment of inflammatory pathology of the nose and paranasal sinuses. One of the drugs of this group is – «Sinupret» extract. It contains components of well-known medicinal plants: gentian root, verbena and sorrel grass, primrose and elder flowers.

The results of the study are presented in Table N 1 .Table N 1.

Terms of examination	Acute rhinosinusitis Mucociliary clearance (min)			Chronic rhinosinusitis Mucociliary clearance (min)		
	1 группа	2 группа	3 группа	1 группа	2 группа	3 группа
Before treatment	26,2±0,61	27,1±0,64	28,3±0,67	27,7±0,65	28,1±0,67	30,4±0,69
On the 7th day	13,4± 0,19	16,9± 0,26	17,6± 0,37	14,9± 0,44	19,7± 0,32	21,1± 0,23
On the 14th day	12,5±0,15	14,3±0,12	14,9±0,51	13,8±0,69	15,5±0,34	18,4±0,21
P	<0,025 <0,031 <0,040	<0,024 <0,019 <0,022	<0,041 <0,018 <0,027	<0,031 <0,034 <0,015	<0,034 <0,032 <0,047	<0,037 <0,023 <0,061

In total, we observed 64 patients with acute and chronic rhinosinusitis who received the drug «Sinupret» extract as part of complex therapy. The control group consisted of 21 patients who received antibacterial therapy, but without secretolytics. «Sinupret» was prescribed according to the scheme: 1 tablet 3 times a day, the duration of treatment averaged 14 days. All patients were measured mucociliary transport before treatment, on day 7 and on day 14 of treatment, which allowed us to evaluate the comparative effectiveness of the treatment.

As a result of our research, we found a significant acceleration of mucociliary transport. This was especially noted in the first week of treatment. In addition, when analyzing the dynamics of the main rhinoscopic parameters among patients receiving «Sinupret» extract, a faster decrease in symptoms such as edema and hyperemia of the mucous membrane was noted, as well as the amount of pathological secretion decreased. (Figs. No. 1 and No. 2).

As a result of our study, we found that patients receiving «Sinupret» extract had a faster dynamics of improvement in the speed of mucociliary transport of the nasal cavity. In addition, subjective signs of the disease in patients receiving «Sinupret» extract, a more significant regression of the main symptoms of rhinosinusitis was observed.

Conclusions

Thus, we confirm the data on the positive effect of the secretolytic «Sinupret» extract on the speed of mucociliary transport of the nasal cavity in patients with rhinositusitis on the background of cerebral palsy.

In addition, «Sinupret» extract reduces the viscosity of nasal secretions by stimulating secretory cells of the nasal mucosa and paranasal sinuses. One of the main pharmacological properties of the plants included in the preparation is the

ability to block the exudation phase and reduce the permeability of the vascular wall. Due to this, the drug is able to reduce the severity of swelling of the mucous membrane of the nasal cavity and paranasal sinuses, which greatly facilitates the evacuation of secretions. Another aspect of the therapeutic effect of «Sinupret» is the ability of primrose flowers, which are part of the drug, to increase the activity of the ciliated epithelium and thereby accelerating mucociliary transport. Due to this, it is safe to say that «Sinupret» is able to have not only mucolytic, but also mucokinetic effects.

The pharmacological effect of bioflavonoids in the composition of «Sinupret» extract increases the secretion of chloride by activating the transport of chlorine through the channels of the transmembrane conduction regulator, dilutes the secret by stimulating the secretion of chlorine -the respiratory epithelium becomes more hydrated, stimulates mucociliary clearance and increases the frequency of beating of the cilia of the ciliated epithelium. Based on the results of the study, mucoactive drugs should be more widely used in the complex therapy of inflammatory pathology of the nose and paranasal sinuses. The choice of a particular drug acting on ciliary activity is largely determined by the phase of the disease, the nature of the change in the secretion itself and the mechanism of action of the drug itself.

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