



Costs Syndrome in Children, Causes, Comparative Diagnosis and Rational Therapy (Review of the article)

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Annotation: This publication deals with topical problems in the management of patients with cough. It presents its epidemiology and clinical classification, an analysis of its causes, a list of required diagnostic techniques, and areas of pharmacotherapy. Emphasis is laid on the differential diagnosis of different abnormalities and diseases, the leading clinical sign of which is cough. The authors provide the detailed characteristics of medicaments for its treatment and the principles of rational antitussive and mucoactive pharmacotherapy.

Key words: Cough, differential diagnosis, antitussives, mucoactive therapy.

In children, coughing in the norm may be very rare, it can be observed when mucus accumulates in the throat.

Cough is one of the most common unpleasant symptoms in autumn and winter in cold weather, infections, viral infections, ORVI accompanied by inflammation of the upper respiratory tract, influenza and other diseases.

It should be noted that cough in children has its own characteristics. Due to the lack of central control in infants, the cough reflex is also not fully developed, so cough is often not observed in inflammatory diseases of the respiratory system, and cough is associated with vomiting syndrome [1,3].

In preschool children, especially children under one year of age, the cough is dry. The importance of bronchospasm and hyperreactivity of bronchial activity in the mechanism of origin of cough in school-age children

Currently, cough syndrome is observed in more than 40-50 different diseases [4]. These include diseases of the respiratory system (acute bronchitis, obstructive bronchitis, chronic bronchitis, bronchial asthma, pneumonia, lung abscess, tuberculosis, obstruction of the tracheal bronchi due to enlargement of the lymph nodes in the chest - sarcoidosis, lymphoma), interstitial pleural effusions, pulmonary edema ; cardiovascular diseases (heart failure, pulmonary embolism, pericarditis, heart



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defects); Diseases of the ENT organs (rhinosinusitis, pharyngitis, reflex cough in pathology of the outer and middle ear); diseases of the gastrointestinal tract (gastroesophageal reflux disease - GERB, diaphragmatic esophageal sphincter); side effects of drugs (angiotensin-converting enzyme - ACE inhibitors, aerosols, oxygen); psychogenic, neurotic cough [2,5]. Depending on the nature of the cough is divided into 2: dry and wet cough.

Hyperproduction of mucus in the bronchi is observed when there is an infectious inflammatory process in the respiratory tract with a moist, that is, sputum cough. The cough can be mild and severe, short-term depending on the duration, or aggressive, and divided into permanent. The most important criterion is to determine the underlying cause of the duration of the cough. The cough is divided into acute and chronic. Acute cough (short-term) lasts less than 3 weeks and chronic (long-term) lasts more than 8 weeks. If the cough lasts from 3 to 8 weeks, it is called acute sub (prolonged) or "post-infection" cough. Acute cough is mainly observed in patients with acute viral infection of the upper and lower respiratory tract, pneumonia, bronchial asthma. Acute subcutaneous (post-infection) cough develops due to hyperreactivity of the bronchi after a viral infection. Prolonged dry cough is often observed in patients with GERB in chronic diseases of the ENT organs (sinusitis, rhinitis). In the diagnosis of patients with cough - attention is paid to the complaints, the history of the disease, the results of general, laboratory, instrumental examination of patients. Analysis of the clinical features of cough is important in the comparative diagnosis. For example, if there is an aggressive "whistling" cough (cough stimulus, frequent, recurrent), it is characteristic of whooping cough (*Bordetella pertussis*). In tracheobronchial dyskinesia syndrome (expiratory stenosis of the trachea), the cough is rough, aggressive, and is exacerbated when talking or laughing. Bronchial asthma is characterized by an evening aggressive cough, while chronic bronchitis is characterized by a morning dry cough. If there is a pathological process in the chest cavity (sarcoidosis, lymphadenopathy), the cough is exacerbated when the patient is lying down. The cough disappears when the patient is in a horizontal position, which is associated with pleurisy. The volume, color, importance of sputum in a wet cough is great, if the color of sputum is green, it is an indication for antibiotics. If you constantly produce large amounts of foamy sputum, from 1 liter to 3 liters per day (bronchitis), it is characteristic of bronchiolo-alveolar cancer. If a tumor develops in the lungs as a result of left ventricular failure, the patient produces a large amount of pink foamy sputum. In bronchial asthma, sputum is thick, thick, difficult to excrete. In croupous pneumonia, sputum is rusty. General clinical examination of sputum is important because it helps to determine the presence of cellular elements (neutrophils, eosinophils, erythrocytes), specific indicators - Kurshman spirals, Shako-Leydin crystals. Detection of eosinophils, Kurshman's spirals and Shako-Leidins in sputum is characteristic of bronchial asthma [6,7]. The presence of large amounts of neutrophils in the sputum indicates an inflammatory process (for example, in the development of chronic bronchitis), in which case it is necessary to consider the use of antibiotics. When examining a patient with a cough, it is necessary to conduct a chest radiograph.

To treat a cough, of course, it is necessary to determine the cause and start with the treatment of the underlying disease.

The following factors should be considered when using cough medicines.

Causes of cough.

1. The development of the cough reflex in children



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2. Depending on the mechanism of action of antitussive drugs.

Treatment of cough should first be etiologic, i.e., the cause should be determined.

Two different methods are used to reduce cough: pharmacological and nomedic. There should be no smokers at home in a nomedikamentoz method, which reduces coughing. Patients with ORVI should be given more fluids, provided the room with enough fresh moist air, and not given cough-inducing drugs. Pharmacological administration of antitussives. Antitussive drugs are drugs, ie drugs that reduce cough at the central or peripheral levels and are effective. Dry cough is treated with drugs that suppress the cough reflex. For example, in the presence of tumors of the respiratory tract, whooping cough and tracheobronchial dyskinesia are accompanied by a strong dry cough at night [8]. Substances that control cough by changing the nature and amount of secretions in the bronchi include active drugs. We divide them into 3 main groups: 1) mucokinetics - drugs that affect the rheological properties (volume, viscosity, mobility); 2) mucolytics - drugs that affect the rheological properties (viscosity, elasticity, adhesion); 3) mucoregulators - drugs, substances that alter the ratio of stem cells of the bronchial mucosa and the developed secretion; Group 3 also includes mucociliary clearance (MTsK) stimulators (MTsK) - drugs that restore the ciliary cells of the bronchial mucosa or maintain functional activity, they have a broncholytic effect.

Cough drugs are divided into 3 groups:

divided into drugs that affect the central part, have a peripheral effect and are combined.

Antitussive drugs with a centralized effect (narcotic and non-narcotic) have an inhibitory effect on the cough center and higher centers, reducing the effect of the cough reflex. These drugs prevent the formation of a dry, sticky, persistent cough reflex and worsen the patient's condition. Drugs in this group are used to prevent the constant formation of dry, sticky cough, which worsens the patient's condition. The disadvantages of antitussive drugs that have a narcotic effect are that: patients become accustomed to and addicted to these drugs; decreased activity of the respiratory center; the presence of a hypnotic effect leads to the development of intestinal atony [10]. Therefore, antitussive drugs (codeine, synecode, etc.) are not widely used in pediatrics (Korovina N.A., Zakharova I.N., Zaplatnikov I.A.2003).

To date, a group of drugs has been formed that are free from the above shortcomings. The difference from drugs that have a narcotic effect: it does not bind to drugs and does not adversely affect the cough center. These drugs include - Libeksin, Tusupreks, Sinecode, Glauttsin and others. These drugs act only on dry cough, affecting the receptors of the tracheobronchial tree, affect the cough reflex and have a sedative, as well as bronchodilator effect.

Depending on the effectiveness of many drugs, the effect of Sinekod is similar to that of antitussive drugs and is superior.

It should be noted that drugs that affect the center are not given to infants, because these drugs narrow the bronchi and worsen the oxygen supply.

Drugs that affect the periphery affect the afferent or efferent stage of the cough reflex. These drugs can be given in inflammation of the upper respiratory tract (ARVI, sinusitis, pharyngitis, etc.) and lower respiratory tract (bronchitis, bronchiolitis, pneumonia). Drugs with peripheral effects have the following effects [9].

It has expectorant, mucolytic, combined effect (expectorant and mucolytic), moisturizes the mucous membrane. Drugs with an afferent effect are given local anesthetics (benzocaine, cyclain,) wrapping



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drugs - a set of herbal medicines, syrups, teas, tablets for infusion and glycerin, honey, etc.). In addition to medications, afferent cough medicines can also be added - aerosols and vapor inhalation. These include efferent drugs against sputum cough, the effect of which is to reduce the reflex stimulation of the cough. Administration of these drugs to infants is limited because coughing and vomiting may further stimulate the center and may lead to aspiration, especially if the child has a damaged central nervous system. The effect of all expectorants is short-lived, so these medications can be used several times a day.

Combination drugs form the main group, which include drugs with two or more different side effects: non-narcotic drugs with a central effect, mucolytics, expectorants, antipyretics or antihistamines. When using combination drugs, the effectiveness of treatment showed higher rates than monotherapy. Of particular importance is the new drug in this group "Alex Plus" (India Glenmark Pharmaceuticals Ltd). This drug contains dexamethorphan hydrobromide 2 mg, terpine hydrate 2 mg and levomenthol 750 mcg. The antitussive effect of dexametharphane inhibits the cough center, reduces the mechanism of origin of cough, despite the fact that it has no drug effect, but has a pain-relieving and sedative effect. The effect begins 10-30 minutes after taking the drug, lasts 5-6 hours in adults and 6-9 hours in children.

Terpine hydrate has a expectorant effect, increases the secretory activity of the epithelial glands of the respiratory tract, reduces the viscosity of sputum, thereby maintaining airway clearance.

Levamentol has a spasmolytic effect, relieves the general condition of the patient when symptoms of acute rhinitis, pharyngitis, laryngitis, bronchitis appear.

These drugs are allowed to use from the age of 4, adults are given 2-5 lozenges, 3-4 times a day, the maximum dose is 20 lozenges.

Children from 4 to 6 years old should take 1 lozenge 3-4 times a day, 7 to 12 years old 1-2 lozenges 3-4 times a day, no more than 8 lozenges. The lozenges should be pushed until melted.

Thus, the drug "Alex Plus" is recommended for chronic and acute diseases with dry cough, cough syndrome of various etiologies. Along with cough medicines, the use of natural remedies helps to overcome the disease faster, i.e. milk, honey, butter have the property of softening it even if it does not cure the cough. It is recommended to travel more in the fresh air to strengthen immunity.

Mucokinetics (expectorants) are divided depending on the mechanism of action - direct and reflex. Direct-acting drugs have the property of separating the bronchi from the mucous membrane after injection in the gastrointestinal tract. Normalizes bronchial fluid formed in the cell. These include the following drugs: bromhexine, ambroxol, carbocysteine. These drugs have mucolytic and secretolytic effects, increase the lysosomal activity of the vitreous cells of the epithelium of the respiratory tract. The use of carbocysteine restores IgA secretion, improves MTsK by restoring the activity of ciliated cells [3].

MTsK stimulants include - b₂ -adrenomimetics (salbutamol, fenoterol). Salbutamol increases MTsK, increases the secretion of mucous membrane glands and surfactant, has a broncholytic effect. Combined protective drugs. If the patient has more than one symptom of tracheobronchial tree lesions at the same time (cough, sputum is difficult to separate, bronchial obstruction), then the combined drug is used. An example of this is the drug ascorbyl. It contains mucolytic (bromhexine), mucolytic / mucokinetic (guaifenesin) and b₂ - adrenomimetic (salbutamol). These components have a synergistic effect, improve MTsK, regulate sputum secretion and rheological properties,



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reduce bronchial excess tone. As a result, the bronchi are quickly cleared of mucus, and the cough is reduced, leading to its complete disappearance. Askoril affects all parts of the pathogenesis of acute and chronic pulmonary diseases (BA, OB and SB, pneumonia), which simultaneously with difficulty excreting thick sputum. The effectiveness of this drug has been studied in adults and children. The use of this drug reduces the duration of treatment of the disease and the administration of other drugs to the patient. Herbal preparations have emollient, anti-inflammatory and anti-inflammatory effects, in addition to the mucokinetic effect, along with the separation of the bronchi from the mucous membrane. The sputum softens, liquefies, and hardens easily.

General principles of rational pharmacotherapy in cough. Often patients seek medical attention with an acute cough as a result of URVI (inflammation, acute pharyngitis). Such patients should be advised to use emollients, moisturizers, more warm water, alkaline inhalations.

In acute cough, antitussive drugs are not given because they cause accumulation of mucus in the airways and lead to infection, pneumonia can develop. At the same time do not give cough medicines and mucoactive drugs. If the patient with obstructive bronchitis has a wet cough, shortness of breath, fever, wheezing, dry wheezing in the lungs on auscultation, then it is necessary to conduct mucoactive therapy (bromhexine, ambroxol, acetylcysteine). If the patient has a wet cough with obstructive syndrome (OB, HOBL), a combination drug is used, in combination with mucolytics and bronchodilators (ascorbyl). Broncholytics (salbutamol, fenoterol, ipratropia bromide) are used when bronchoobstructive syndrome is strongly developed and there are signs of bronchial hyperreactivity.

In severe patients, the drugs are administered parenterally and through a nebulizer. Patients with bronchiectasis, cystic fibrosis have a large volume of sputum, to which long-term use of mucoregulators (carbocysteine) reduces the formation of secretions. The main principles of rational mucoactive therapy are combined methods combined with non-drug methods (breathing gymnastics, massage, more walking in the fresh air, proper nutrition).

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