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Modifying Therapy for Severe Pneumonia with the Use of Bactericidal Recirculator Reflash 60

Isaeva L. I.
Pediatrician, Department 2-Pediatrics, Samarkand branch of the RSCEMC, Samarkand, Uzbekistan

Tursunkulova D. A.
Head of Department 2-Pediatrics, Samarkand branch of the RSCEMC, Samarkand, Uzbekistan

Kadirov R. N.
Scientific consultant, senior researcher: director of Samarkand branch of the RSCEMC, d.m.s., Samarkand Uzbekistan

Abstract: Acute respiratory tract infections (ARTIs) in children are a common reason for seeking emergency medical care. The severity of these conditions ranges from mild, self-limited illnesses to life-threatening forms of rapidly worsening airway obstruction. A high degree of vigilance is required for prompt diagnosis and initiation of treatment. This review focuses on the general principles of evaluation and management of respiratory emergencies in children, as well as the clinical features and treatment options for specific conditions, including croup, epiglottitis, bacterial tracheitis, retropharyngeal abscess, foreign body ingestion, and toxic inhalation sequelae. Research shows that among the etiological factors of pneumonia, various bacterial and viral agents have been identified, the significance of which is not fully understood, but these cases are characterized by mixed results, lack of complete data and insufficient coverage in the literature. Severe pneumonia is pneumonia characterized by severe respiratory failure (RF) and/or signs of sepsis and multiple organ dysfunction. Today, the problem of severe pneumonia is relevant, due to the high mortality of the disease, the presence of a wide range of poly- and multi- resistant strains of microorganisms.

Thus, at present, the study of severe pneumonia in children has not been sufficiently studied, and the issue of using modern methods of preventing infection remains insufficiently addressed. In this regard, issues related to establishing the degree of influence of modifiable and non-modifiable factors on the development and course of severe pneumonia in children require further study; it is necessary to search for new methods for predicting the course and outcome, develop and implement new methods of treatment and prevention of the disease, which determined the relevance of our research.

A recirculator is a device for air disinfection. Air from the room enters the recirculator, where it is cleaned, and then it exits back into the room. The air goes in a circle or circulates. Recirculator can be considered any device that starts the process of air circulation, and at the same time cleans it from pollutants, harmful microorganisms. In practice, the word "recirculator" is often used for devices with high efficiency - professional devices or household options with a filtration system that is in no way inferior to medical standards.

Usually, these devices are installed in places where there are high requirements and standards for cleanliness. And they reduce the risk of developing dangerous bacterial, viral infections in the room, increase the safety of people and animals that are in it. The device is based on the recirculation of air flows with the effect of ultraviolet radiation with a certain spectrum on the air. If the wavelength is observed within 180-300 nm, then a bactericidal effect on microorganisms will be exerted. As a result, the DNA of the bacterial cell nucleus will be damaged, and then it will be destroyed, the growth and development of pathogenic microorganisms will cease. But to kill viruses, more powerful ultraviolet radiation will be required, its indicator should be within 300-380 nm.

Keywords: children, approaches, severe pneumonia, bactericidal recirculator reflash-60.

Introduction

Respiratory diseases in children are one of the important problems of pediatrics and pediatric pulmonology. Despite the advances made in diagnosis and treatment, respiratory diseases still occupy one of the first places among the diseases of children and adolescents [1,2,7]. The growing trend of respiratory pathology in children and the possibility of a high risk of relapse of severe pneumonia determine the relevance of studying the factors and mechanisms of the formation of pneumonia in children. Currently, the relevance of works devoted to the significance of markers that determine the course of the disease and the effectiveness of antibacterial therapy remains. Data are provided on the prognostic capabilities of virologic examination of sputum, respiratory smear by polymerase chain reaction, determination of the degree of air pollution, study of indicators of the blood coagulation system, determination of the level of inflammatory markers in children, as the most informative laboratory criteria for diseases and the need for their timely determination. Determining the level of indicators of the blood coagulation system allows you to reduce the duration of ABT by 1.5-2 times, the length of hospital treatment, reduce the frequency of adverse drug manifestations, be one of the indicators of a complicated outcome of the disease, and help reduce the development of bacterial resistance in children [10].

Inflammation, which is the main component of the pathogenetic component of the formation of clinical signs of respiratory tract damage in atypical pneumonia, and the severity of the condition of patients with reduced immunity in the acute period of the disease force us to look for new methods of treatment, diagnosis and prevention [3,5,9]. Today, one of the methods of prevention and treatment is a bactericidal recirculator - a device used to disinfect indoor air in the presence of people, purifying the air from viruses, bacteria, microbes and allergens. In patients during whose treatment a bactericidal recirculator was used, the body's protective properties against bacteria and viruses are enhanced, the frequency of acute respiratory infections is reduced, their duration is shortened, and the likelihood of complications of severe pneumonia is reduced. [4,6,8]. Children treated with standard therapy in combination with the use of a bactericidal recirculator both in outpatient and inpatient settings experienced accelerated clinical recovery, as well as faster disappearance of symptoms compared to traditional therapy.

The purpose of the scientific work: to study the effectiveness of using a bactericidal recirculator apparatus in the treatment of severe pneumonia in children.

Materials and methods of research. Depending on the prescribed therapy, 120 patients aged from 6 months to 7 years, undergoing inpatient treatment in the children's departments of the Samarkand branch of the RSCEMC, were divided into 2 groups. The main group of 60 children with severe pneumonia and the second group of 60 children with severe course of pneumonia. In both groups, anamnestic and follow-up data were collected, examinations were carried out using generally accepted clinical, laboratory, instrumental, and also special research methods. Patients of the first group were divided into two subgroups. Group 1a of 30 children received standard

therapy, a set of preventive measures, and the bactericidal recirculator reflash 30 was used in addition to standard therapy; subgroup 1b received only standard therapy.

Study results: Indications for hospitalization in 80 (66.6%) patients were acute respiratory failure, 40 (33.4%) increased body temperature, 76 (63.3%) cough, rhinorrhea in 44 (36.6 %) patients, sore throat in 55 (45.8%) broncho-obstructive syndrome in 48 (40.7 %) patients, toxicosis in 18 (15.6%) patients. All patients received appropriate antibiotics and symptomatic therapy.

Increase in the concentration of inflammatory markers and cytokines in patients indicates a response of the child's body to an infectious agent, the degree of which most likely depends on the specific etiological agent, the results of which will be presented in a comparative analysis in children with severe pneumonia.

Analysis of changes in the blood coagulation system in patients with severe pneumonia showed that the concentrations of the determined indicators in the blood were significantly higher both in comparison with standard indicators and with the level of severe pneumonia.

In subgroup 1a, patients receiving standard therapy in combination with the use of the bactericidal recirculator reflash 60 experienced rapid positive dynamics, a decrease in the addition of a secondary infection, and a shortening of bed days. Improvement in general condition and regression of clinical manifestations of the disease were recorded 2.2 days earlier in patients of group Ia than in group Ib.

The discussion of the results. According to the results of examination and treatment of severe pneumonia in children who took standard therapy and our proposed complex of treatment and preventive measures using the bactericidal recirculator reflash 60, in addition to standard therapy, was accompanied by rapid positive dynamics, signs of intoxication were relieved by an average of 3.6 ± 0.4 days, cough disappeared for 4.9 ± 0.7 days, percussion changes in the lungs normalized for 6.2 ± 0.5, auscultatory changes for 6.4 ± 0.6 days. No adverse reactions were observed when using the bactericidal recirculator.

Conclusions. Thus, a bactericidal recirculator, in addition to standard therapy, helps reduce the incidence of severe pneumonia, reduce the risk of secondary infection, reduces the likelihood of aggravating the course of severe pneumonia, and also increases the body's resistance to infections of the respiratory system. Ease of use, high efficiency and absence of significant side effects allow us to recommend this device for wide use in pediatrics.

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