THE COURSE OF NOSOCOMIAL PNEUMONIA IN PATIENTS ON LONG-TERM ARTIFICIAL LUNG VENTILATION

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Resume: *Pneumonia is a serious disease in which an inflammatory process occurs in the lungs. In children, this disease is often especially difficult due to the immaturity of the respiratory apparatus, as well as the inability to fully cough up sputum. Pathology requires mandatory prescribing of antibiotics and symptomatic drugs, and in severe cases, hospitalization in a hospital. Pneumonia that occurs within the walls of medical institutions is such a serious problem that they form a separate category – nosocomial pneumonia. The incidence of hospital pneumonia is 5-10 cases per 1000 admissions to the hospital, but it increases by 6-20 times in patients on artificial lung ventilation.*

Keywords: *Nosocomial pneumonia, lung ventilation, patient, hospital, aspiration, bacterium, manifest.*

Introduction. Nosocomial pneumonia associated with ventilation is pneumonia that develops no earlier than 48 hours after intubation and the start of ventilation, in the absence of signs of pulmonary infection at the time of intubation. However, in many cases, the manifestation of nosocomial pneumonia in surgical patients is possible at an earlier date. The incidence of hospital-acquired pneumonia reaches 20% of all hospital infections and is observed more often in patients after surgery on the thoracic or abdominal cavity, in patients who are on artificial ventilation and in patients with immunodeficiency.

With any therapeutic and diagnostic procedure, the risk of developing nosocomial infections increases and increases with an increase in the invasiveness of interventions. According to some reports, almost 15% of patients become infected during medical care.

Up to 86% of cases of nosocomial pneumonia among surgical patients occur in patients on a ventilator.

According to statistics, nosocomial pneumonia ranks second among all hospital infections. This is about 20% of infectious infections inside medical institutions. At the same time, nosocomial pneumonia is the most common cause of death in intensive care units. In this sense, the disease is a serious medical problem, the solution of which lies in different planes. These are improvement of sanitary conditions of medical institutions, professional development of medical staff, as well as the search for new antibacterial drugs and their correct use.

The purpose of the study: to establish the etiological structure of ventilator-associated pneumonia in the studied patients, to determine the pattern of antibacterial sensitivity of the main pathogens.

Nosocomial pneumonia is pneumonia that develops 48-72 hours after admission to the hospital and which did not exist and was not in the incubation phase until admission.

Nosocomial pneumonia associated with ventilation is pneumonia that develops no earlier than 48 hours after intubation and the start of ventilation, in the absence of signs of pulmonary infection at the time of intubation. However, in many cases, the manifestation of nosocomial pneumonia in surgical patients is possible at an earlier date.

The incidence of hospital-acquired pneumonia reaches 20% of all hospital infections and is observed more often in patients after surgery on the thoracic or abdominal cavity, in patients who are on artificial ventilation and in patients with immunodeficiency.

The most common cause is microaspiration of bacteria that colonize the oropharynx and upper respiratory tract in seriously ill patients. Contamination of the lungs due to bacteremia or inhalation with infected aerosols (i.e. airborne particles containing pathogens of the genera Legionella, Aspergillus or influenza viruses) are less common causes. Endotracheal intubation with a ventilator poses the greatest risk; ventilation accounts for > 85% of all cases, and the development of pneumonia occurs in 9-27% of patients on a ventilator. The highest risk of ventilator-associated pneumonia occurs during the first 10 days of intubation. Endotracheal intubation disrupts respiratory tract protection, cough and mucociliary clearance and facilitates microaspiration of bacterial-seeded secretions that accumulate above the inflated cuff of the intubation tube. In addition, the bacteria form a biofilm on and in the intubation tube, which protects them from antibiotics and host immunity.

In unintubated patients, risk factors include previous antibiotic therapy, high pH of gastric juice (due to the prevention of stress ulcers or treatment with H2 blockers or proton pump inhibitors), concomitant cardiac, respiratory, hepatic or renal insufficiency. The main risk factors for postoperative pneumonia are age >70 years, abdominal or thoracic surgery, and functional exhaustion.

Materials and methods of research. The paper analyzes the treatment of 48 patients who were on ventilators in the intensive care units of the Regional Children's Hospital for the period 2019-2021. Depending on the presence of VAP, the patients were divided into 2 groups. Group I or the main group consisted of 27 patients who developed VAP. Group II or the control group consisted of 21 patients without the above complication. The criterion for inclusion of patients in the study was the duration of ventilation for at least 48 hours. Cultures of tracheal aspirate from the lower respiratory tract showed significantly greater sensitivity in determining the microorganisms responsible for the development of VAP. Sputum collection was performed using fibrobronchoscopy. Tracheal aspiration and bronchoalveolar lavage were also used. Inoculation of aspirate from the lower respiratory tract was more often positive in patients of the main group than in the control group: 74% (20) and

37% (10), respectively. In 59.2% (16) of cases in the main group and 22.2% (6) in the control group, flora was isolated in various associations. For the development of pneumonia in the main group, it was significantly higher when seeding gram-negative bacteria: Pseudomonas spp. (6 cases), Acinetobacter spp.(3 cases), C1ebsiella pneumum (2). The greatest sensitivity in Pseudomonas spp was determined to ciprofloxacin (91.1% of isolates). Sizomycin (77.8%), amikacin (80.0%) and netilmycin (74.1%) showed approximately equal activity against Pseudomonas spp. The number of strains of Pseudomonas aeruginosa resistant to gentamicin reached 21.6%, and another 8.1% had moderate sensitivity.

Only half of the Pseudomonas strains (54.5%) were sensitive to piperacillin. Of the cephalosporins of the third generation, sufficient activity was determined in ceftazidime: 71.4% of pseudomonas isolates were sensitive to this ABP, whereas only 33.3% of the strains were sensitive to cefotaxime (of which 25.0% had moderate sensitivity). Other gram-negative bacteria were sensitive to ciprofloxacin in 100.0% of cases: Klebsiella pneumoniae, E. gardens, non-fermenting flora. However, 1/3 of klebsiella strains (33.3%) had moderate sensitivity to ciprofloxacin. In relation to Klebsiella pneumoniae, amikacin was a fairly active drug (42.8% - high and 28.6% - moderate sensitivity). Non-fermenting gram-negative flora, Klebsiella pneumoniae and E. coli were resistant to cephalosporins of the first two generations. 57.1% of the isolated klebsiella cultures were sensitive to cefotaxime (14.2% of them moderately).

Conclusion: Thus, the etiological structure of VAP was dominated by gram-negative. Pseudomonas spp., Acinetobacter spp., non-fermenting gram-negative flora and Klebsiella pneumoniae were the most frequently isolated. These microorganisms showed significant resistance to the main antibacterial drugs. Ciprofloxacin was the most active against gram-negative flora. Sensitivity to other ABPS in different bacteria varied widely. Blood cultures had limited value for determining the etiological causative agent of VAP.

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