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Research Article

STUDY OF SENSITIVITY TO ANTIBACTERIAL DRUGS OF SIGNIFICANT PATHOGENS OF BRONCHOPULMONARY DISEASES IN CHILDREN

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ABSTRACT

The spread of infectious diseases has significant economic consequences, as they lead to high treatment costs, reduced labor productivity and the need to implement measures to prevent and control epidemics. The problem of antibiotic resistance is largely related to the frequent and improper use of antibiotics in the treatment of children. The increased sensitivity of children's organisms to infections and, in some cases, the lack of alternative treatment methods lead to the spread of resistant strains of microorganisms. It is important to strictly control the use of antibiotics in children, to carry out rational and precisely dosed therapy, as well as to provide information to parents about the need to comply with prescribed prescriptions in order to reduce the risk of developing resistance and maintain the effectiveness of antibiotics in the treatment of childhood infections.

KEYWORDS

It is important to strictly control the use of antibiotics in children, to carry out rational and precisely dosed therapy.

INTRODUCTION

Optimization of treatment with antibacterial drugs is one of the most important methods of countering the development of resistance of microorganisms to antibacterial drugs. This is achieved through the

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introduction of dynamic monitoring of the sensitivity of microorganisms to antibacterial drugs and the rational selection of antimicrobial drugs. Systematic and timely determination of the sensitivity of microorganisms allows you to accurately select antibacterial drugs, while maintaining their effectiveness. Thanks to this approach, it is possible to reduce the likelihood of microbial resistance, provide effective treatment and prevent the spread of infections that do not respond to standard antibiotics.

The irrational use of medicines is the main reason for the increase in mortality rates and undesirable side effects. Despite the progress of modern medical science and practice, this problem remains serious all over the world, including Uzbekistan and other countries. Indeed, the problem of irrational use of medicines requires research on the consumption of medicines at a certain level of the population. The main purpose of such studies is to determine whether drug therapy is rational. To achieve this goal, it is necessary to apply appropriate methods to assess the rationality of drug treatment. When solving any problem, including curbing antibiotic resistance, it is important to identify the key aspects that can be most significantly affected in order to achieve the goals as quickly as possible.

Methods. The data of bacteriological crops in children from 3 months to 5 years old were analyzed. A disco-diffuse laboratory method was used to determine the sensitivity of pathogens to antibiotics.

RESULTS

Antibiotic sensitivity testing refers to a laboratory testing method that is used to determine the sensitivity of bacteria to various antibiotics. When conducting a sensitivity culture tank, a sample of tissue or liquid containing bacteria is placed on a special medium where bacteria have the opportunity to grow. Then discs or strips with different antibiotics are added to this medium. If the bacteria are sensitive to a particular antibiotic, then there will be a bacterial growth inhibition zone around the antibiotic disc, i.e. a zone where bacteria do not grow. The size of the inhibition zone (or sensitivity zone) is measured in millimeters (mm). Thus, the value in millimeters indicates the size of the zone of sensitivity of bacteria to a particular antibiotic. The larger the size of the inhibition zone, the more effective this antibiotic is against these bacteria. A smaller area size may indicate bacterial resistance to an antibiotic or that the drug may be less effective in treating an infection caused by these bacteria.

The minimum and maximum values for sensitivity zones in millimeters may vary depending on the specific antibiotics and bacterial strains, as well as the techniques and interpretations used. The determination of the minimum and maximum values in

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millimeters can be carried out on the basis of reference data and recommendations usually provided by manufacturers of antibiotics or laboratories conducting bacteriological studies. In general, the values of antibiotic sensitivity zones can be different, from about 6-8 mm to several tens of millimeters, depending on the microorganism and the antibiotic. A wider sensitivity zone (a higher value in mm) indicates a more effective action of the antibiotic against a specific bacterial strain. However, for more accurate information about the specific minimum and maximum values for a particular antibiotic and bacterial strain, reference materials, manufacturer recommendations or conducting laboratories should be consulted, which will provide more accurate data for the appropriate antibiotic and the bacteria being studied.

Resistance to antibacterial drugs is of great socio-economic importance and is considered a threat to national security in developed countries and around the world. Infections caused by resistant strains are characterized by a long course, frequent hospitalizations and extended hospital stay, which worsens the prognosis for patients. The ineffectiveness of the first choice of drugs requires the use of alternative drugs, which are often more expensive, less safe and not always available. All these factors increase the direct and indirect economic costs, as well as increase the risk of spreading resistant strains in society. Indeed, resistance to antibacterial drugs manifests itself at different levels - global, regional and local. It is important to take intoaccount global trends in the development of resistance, as many microorganisms are rapidly developing antibiotic resistance around the world. An example of such microorganisms are staphylococci, pneumococci, gonococci, Pseudomonas aeruginosa and others. However, it is worth noting that resistance does not apply to all microorganisms and all antibacterial drugs. Some microorganisms, such as S.pyogenes and T.pallidum, remain sensitive to beta-lactams, and H.influenzae is sensitive to cefotaxime or ceftriaxone.

In each medical and preventive institution, it is necessary to have local data on antibiotic resistance, the so-called "resistance passport". This is especially important for departments with a high frequency of antibiotic use, such as intensive care units, burn units, urological units and others. Information on resistance should be presented in a differentiated manner, taking intoaccount different departments and microorganisms. This will allow for effective antimicrobial therapy, taking intoaccount the characteristics and local resistance patterns.

The analysis showed that the highest percentage of cases of the complicated form of viral pneumonia (VP) is observed in children aged 1 to 3 years, especially in boys (12.3%). Children aged 1 to 3 years old (31.2%) were at a particularly increased risk of the disease. This is in line with current trends in pediatrics and clinical

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pharmacology, and is explained by various factors that may affect the prevalence of these diseases.

Tables of boundary values of MPC and diameters of growth suppression zones for determining clinical categories of bacterial sensitivity to antimicrobial drugs are presented in the documents of the European Committee on Antimicrobial Susceptibility Testing — EUCAST) of the European Society for Clinical Microbiology and Infectious Diseases (European Society of Clinical Microbiology and Infectious Disease — ESCMID).

As a result of bacteriological analysis conducted in the laboratory at the TashPMI Clinic, the following pathogens were identified in most cases: S. aureus, S. pneumoniae and S. pyogenes. According to data from foreign studies, OB (obstructive bronchitis), AOB (acute obstructive bronchitis) and many other respiratory diseases in children often have a viral etiology or may begin with a viral infection, and then bacterial pathogens join, which increases the duration of the disease. No virological studies were conducted in this study, therefore, only the result of a bacteriological analysis conducted in the laboratory at the TashPMI Clinic was studied. Pneumococcal infection is the leading cause of pneumonia in children under 2 years of age and the most common cause of bacterial pneumonia in general.

As a result of the analysis of the diameters of growth suppression zones to determine the sensitivity of Streptococcus pneumoniae to antibacterial drugs, a significant decrease in sensitivity to Ampicillin and Azithromycin was revealed.

The highest sensitivity to amoxicillin - clavulanate and to antibacterial drugs of the cephalosporin S-sensative series was noted. Strains with an intermediate level of resistance were detected to Azithromycin in 23.8% of cases and 26.1% of cases to Ampicillin. In 50% of cases, Ampicillin-resistant strains were detected.

Discusiion. In connection with the above, the introduction of a microbiological monitoring system aimed at detecting resistance to antibacterial drugs among significant microorganisms remains relevant. The value of microbiological monitoring for the development and implementation of rational antimicrobial therapy protocols becomes obvious and understandable only with the close cooperation of the bacteriological laboratory, the clinical pharmacology service, epidemiology, clinicians in departments and hospital administration. Microbiological monitoring on a regular basis will allow taking appropriate measures to prevent the spread of infections associated with medical intervention.

CONCLUSIONS

Our study revealed an increase in the antibiotic resistance of pneumococcus to Azithromycin and

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Ampicillin. The high sensitivity of amoxiclav clavulanate remains. It should be noted that pneumococcus remains highly sensitive to injectable cephalosporins, however, cephalosporins are not recommended for widespread use in community-acquired pneumonia in children. To preserve the antibiotic sensitivity of pathogens, it is advisable to limit their use in community-acquired pneumonia. Such a low frequency of S. pneumoniae in pneumonia is explained by previous antibacterial therapy in these children. However, the persistence of strain isolation even after antibacterial therapy may indicate developed resistance to pathogens.

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