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PHARMACOEPIDEMIOLOGICAL BASIS OF THE USE OF ANTIBACTERIAL DRUGS IN OUT-OF-HOSPITAL PNEUMONIA IN CHILDREN OF DIFFERENT AGES

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Abstract: Antibacterial therapy should be started immediately after the diagnosis of pneumonia. Two main trends in the selection of antibiotics have been identified: 1) use of selective drugs that allow rational and economical use of the drug, minimize the effect on the patient's saprophyte flora, reduce the risk of superinfection and avoid unwanted immunosuppressive effects; 2) empirical prescription of broad-spectrum antibiotics. Etiotropic therapy is the mainstay, but due to the difficulty of early detection of the pathogen, adequate antibiotic therapy is often difficult [7, 9].

Key words: antibacterial therapy, antibiotics, early diagnosis.

Antibacterial therapy for pneumonia should be early and adequate (the latter refers to the dose, method of administration and duration of use), and should also be adjusted during treatment depending on the clinical effect of the pathogen and sensitivity to the drug. The effectiveness of the treatment depends, first of all, on the correct choice of the antibacterial drug and its compatibility with the etiology of the disease. Currently, the doctor has many different antibacterial drugs in his arsenal, which are very effective for different etiologies of pneumonia. The presumed etiological variant of pneumonia is the most important guide in choosing the initial antibiotic. The diagnosis of the etiological factor is only indicative and is based on such information as the epidemiological situation, the nature of the background pathology, and the characteristics of the clinical and radiological picture. It should be assumed that the majority of non-pneumococcal pneumonia caused by opportunistic microorganisms is characterized by the clinical course of the disease. Thus, Friedlander's pneumonia usually occurs in people who abuse alcohol for a long time; Pneumonia caused by Haemophilus influenzae - if pneumonia develops in patients with chronic bronchitis and in a patient treated in the hospital, the most likely causative agent is gram-negative flora, in particular, Escherichia coli or Pseudomonas aeruginosa.

The choice of the treatment method is also influenced by the following features of the macroorganism: age, allergy history, liver and kidney function, pregnancy.

The severity of pneumonia is also one of the clinical guidelines for the initial selection of an antibacterial drug and its route of administration.

When prescribing antibacterial therapy, it is necessary to take into account the possible side effects of drugs and avoid prescribing drugs that cause unwanted effects and worsen the course of the main and concomitant diseases. Hypersensitivity to previously used antibacterial agents should be taken into account. In particular, due to the risk of cross-hypersensitivity, other beta-lactam antibiotics should be prescribed with extreme caution to patients with allergic reactions to penicillin. If the patient's history contains information about

repeated courses of treatment of various diseases with penicillin drugs and other antibiotics, the probability of showing beta-lactamase activity in the representatives of the patient's endogenous microflora increases dramatically.

When choosing an antibacterial drug in patients with pneumonia against the background of chronic kidney failure, the dose of the drug excreted by the kidneys should be reduced in proportion to the glomerular filtration rate or preference should be given to the antibacterial drug metabolized in the liver (erythromycin, clindamycin, metronidazole, cefoperazone). On the contrary, if there are signs of liver pathology, its functional failure, the doses of drugs that are mainly metabolized in the liver should be reduced by 1/3-1/2, or antibacterial drugs (aminoglycosides) that are excreted through the kidneys should be preferred. , fluoroquinolones, cephalosporins, except cefoperazone). If the patient has heart failure or obesity, the excretion of antibacterial drugs from the body is disturbed, their concentration in the blood and the risk of side effects increase, which should be taken into account when choosing an antibacterial drug with long-term pharmacokinetics. (cefoperazone, ceftazidime, roxithromycin, clarithromycin).

The age of the patient should be taken into account when choosing an antibacterial drug [10]. Treatment of elderly and elderly people is associated with serious difficulties. The main principle of drug therapy in geriatrics should be to use only the most effective drugs with minimal side effects. However, in addition to drug therapy for pneumonia, people over the age of 60 often need to take drugs to treat concomitant diseases. The need for combined therapy is determined by the frequent exacerbation of the main diseases. Of course, mandatory polytherapy can lead to an increase in side effects. However, it is often impossible to combat polypharmacy by canceling antiarrhythmic, coronary-active and some other drugs. Multidisciplinary treatment of pneumonia should be recognized as a feature of old age [4]. Broad-spectrum antibiotics are more commonly used for people over 60 years of age. This is justified by the polyetiology of pneumonia in this population and the widespread association of gram-positive and gram-negative microorganisms.

The antibiotic to be taken should be characterized by optimal pharmacokinetic parameters: achieving a high tissue concentration, including at the site of inflammation, the maximum possible intervals between drug doses and the need for minimal monitoring. In particular, a pharmacokinetic parameter such as the ability to enter sputum is important in the treatment of patients with pneumonia. In patients with pneumonia, preference should be given to drugs that create high and stable concentrations in sputum. In particular, among aminopenicillins, the concentration of amoxicillin in sputum is twice as high as that of ampicillin when taking drugs in the same doses. In addition, the concentration of amoxicillin in sputum remains at a therapeutic level for a long time. Aminoglycosides do not penetrate the sputum well enough, which is one of the reasons for their incorrect use in this pathology.

It is very difficult to predict the clinical effectiveness of an antibacterial drug in a specific patient, because there are many factors that affect the possible results of antibiotic therapy [10]. These factors can be divided into three groups: macroorganism factors - the human immunological system and its interaction with the pathogen; pharmacodynamic factors of the interaction between an antibacterial drug and a microorganism in the conditions of a macroorganism: bactericidal effect, activity at subinhibitory concentrations, post-antibiotic effect; pharmacokinetic factors.

Adequacy of antibiotic therapy determines recovery time, risk of complications and treatment outcome [1]. Correctly selected antibiotic at the onset of the disease and timely correction of antibacterial therapy over time ensures high efficiency and, most importantly, significantly reduces the cost of treatment. In the treatment of severe pneumonia of local origin, a broad-spectrum antibiotic active against beta-lactamase-producing staphylococci and streptococci, as well as gram-positive microorganisms E. coli, Klebsiella, Enterobacter, H. influenzae, etc. should be prescribed. The initial prescription of extremely strong antibiotics and/or their combinations does not provide advantages, but at the same time increases the risk of selecting problematic microorganisms.

The initial effect of the prescribed antibiotic can be assessed no later than 48 hours, because during the first day the growth and reproduction of sensitive microorganisms is suppressed, then the first positive signs appear in the clinical condition in response to the decrease in intoxication, temperature reaction and laboratory parameters. If it is concluded that the therapy is adequate on the third day of treatment, the course of treatment is continued until the clinical, radiological and laboratory signs of inflammation are normalized. The absence of positive dynamics 72 hours after the start of antibiotic therapy indicates the need to adjust the treatment regimen.

In most cases, preference should be given to monotherapy, its advantages include adequate interaction of antibacterial drugs, unwanted interactions with other drugs, reduction of the risk of developing toxic events, and simplification of medical work. reducing staff and treatment costs.

According to the recommendation of the European guidelines for the clinical evaluation of anti-infective drugs, it is recommended to continue treatment for 3-5 days after achieving stable normalization of temperature in patients with pneumonia with normal immunity. The duration of antibiotic therapy with this approach is usually 7-10 days. The following point should be considered important: after achieving the initial effect, it is not recommended to change antibiotics within the prescribed period of treatment. The duration of antibacterial therapy for complicated community-acquired pneumonia is determined individually. The main criterion for stopping antibiotic therapy is persistent apyrexia (3-4 days in a row). Preservation of individual clinical, laboratory and/or radiological symptoms of the disease is not an absolute indicator to continue or change antibacterial therapy. In most cases, their disappearance occurs by itself or under the influence of symptomatic therapy. If within 48-72 hours after the start of treatment, the continuation or development of clinical manifestations of the disease, the appearance of new focal infiltrative changes in the lungs, the selected antibacterial therapy scheme is considered ineffective. is replaced by an alternative (taking into account the in vitro determination of the sensitivity of the isolated culture of the pathogen to antibiotics).

Patients under 60 years of age with mild pneumonia;

Patients aged 60 and older and/or concomitant diseases (diabetes, chronic kidney failure, congestive heart failure, chronic liver disease, mental illness, alcoholism, etc.); patients with clinically severe pneumonia, regardless of age.

In the first group of patients, a clear clinical effect can be achieved by oral administration of antibacterial drugs. Aminopenicillins (amoxicillin is better than ampicillin in terms of pharmacokinetic parameters) and macrolides are recommended as the drugs of choice. To date, differences in the effectiveness of these groups, as well as individual representatives of macrolide antibiotics, have not been identified. Doxycycline is recommended as an alternative.

In the second group of patients, a clear clinical effect can be achieved by oral antibiotic treatment. Since the possibility of the etiological role of gram-negative microorganisms (including those with some mechanisms of resistance development) is increasing in elderly patients or people with concomitant diseases, "protected" aminopenicillins (ampicillin / sulbactam, amoxicillin / clavulanate) or selfosporins. the second type is recommended as a means of selection (cefuroxime axetin). Given the possibility of chlamydia or legionella infection in this group of patients, combined treatment with macrolide antibiotics seems justified.

The drugs of choice in severe community-acquired pneumonia are third-generation cephalosporins without antipseudomonal activity (cefotaxime or ceftriaxone, maximum doses are recommended) together with macrolides (erythromycin, spiramycin) for parenteral administration. The above combination covers almost the entire spectrum of potential etiological agents of severe community-acquired pneumonia - both "typical" and "atypical".

Chest radiographs of patients with pneumonia

In Russia, severe community-acquired pneumonia is often treated with a combination of β-lactams and aminoglycosides, which is not considered sufficiently proven. Aminoglycoside antibiotics are inactive against pneumococci and atypical pathogens, and have little activity against staphylococci. When arguing about the use of such a combination, they usually mean the possibility of expanding the scope of the combination, demonstrating synergy and overcoming possible resistance. There are objections to each of these arguments.

If gram-negative aerobic microorganisms are sensitive to third-generation cephalosporins, the addition of aminoglycosides does not increase the clinical effect. The idea of a high frequency of synergism between β-lactams and aminoglycosides is somewhat exaggerated.

Resistance of gram-negative aerobic microorganisms to third-generation cephalosporins is now almost always associated with resistance to gentamicin and tobramycin (at least in Moscow). Thus, it is unrealistic to eliminate possible resistance when using such combinations. An additional argument against the widespread use of aminoglycosides is that their use should be accompanied by monitoring of renal function and hearing.

Thus, it is clear that there is no substantial evidence in favor of the widespread use of aminoglycosides for the empiric treatment of severe community-acquired pneumonia, which, of course, does not exclude their use according to indications.

For many years in our country, intramuscular injection of penicillin was used in the empiric treatment of pneumonia, but the change in the spectrum of pathogens with a high percentage of Haemophilus influenzae, mycoplasma and other bacteria not sensitive to penicillin forced us to reconsider. antibacterial therapy tactics. The emergence of penicillin-resistant strains of pneumococci, as well as the need to administer penicillin every 3-4 hours, requires a change in the first-line drug for the treatment of ambulatory pneumonia.

Currently, the need to introduce pharmacoeconomic approaches into daily medical practice has become evident for local medicine. Many pharmacoeconomic studies have proven that the cost of treating a patient is not determined by the price of an antibiotic. To a large extent, it depends on the recovery time and the costs of treating complications.

Pharmacoepidemiological studies provide information on the use of antibacterial drugs for various diseases throughout Russia and in individual regions. Pharmacoeconomics allows finding new approaches to the most rational use of funds. The hospital should have a local passport of antibiotic resistance and a formulation of antibacterial drugs developed taking into account pharmacoeconomic indicators on its basis [8]. More active use of oral antibiotics and gradual introduction of therapy is recommended. Another advantage of antibacterial therapy formulas is the ability to plan and quickly fill drugs in the pharmacy, avoid stressful situations related to the lack of a specific antibiotic for the treatment of a specific patient, as well as the ability to drastically reduce the list of drugs. drugs needed by the hospital.

The importance of introducing a rationally structured list of antibiotics into clinical practice is related to the unreasonably high frequency of their prescription. The formula is based on the nosological structure of patients, the microbial landscape of infectious agents, the nature and level of their resistance to antibiotics, the results of evidence-based studies on the comparative evaluation of the effectiveness of antimicrobial drugs, pharmacoeconomic analysis. , as well as the real possibilities of the budget, mandatory health insurance funds (CHI) and patients themselves [5].

Among infectious diseases, bronchopulmonary diseases take the leading place in terms of the total volume of prescribed drugs and the financial costs of their purchase, more than 30% of antibiotics are used in the

treatment of diseases of the lower respiratory tract. When prescribing drugs, the cost of treatment should also be taken into account and priority should be given to economically feasible antibiotic regimens.

List of used literature:

1. Гойибова Н. С. Гарифулина Л. М. Состояние почек у детей с экзогенно-конституциональным ожирением //Журнал гепато-гастроэнтерологических исследований. – 2022. – Т. 3. – №. 2.
2. Kedrinskaya A. G., Obraztsova G. I., Nagornaya I. I. Cardiovascular lesions in children with obesity //POPULATION. – 2015. – Т. 69. – №. 74. – С. 805.
3. Гарифулина Л. М., Гойибова Н. С. состояние почек у детей с экзогенно-конституциональным ожирением //Журнал Репродуктивного Здоровья и Уро-Нефрологических Исследований. – 2020. – Т. 1. – №. 1.
4. Гарифулина Л. М., Кудратова Г. Н., Гойибова Н. С. Степень метаболических нарушений у детей и подростков с ожирением и артериальной гипертензией //Актуальные вопросы современной науки. – 2016. – Т. 4. – С. 19-23.
5. Гарифулина Л. М., Ашурова М. Д., Гойибова Н. С. Совершенствование терапии метаболического синдрома у подростков при помощи применения α-липоевой кислоты //Наука, техника и образование. – 2018. – №. 10 (51). – С. 69-72.
6. Ишкабулова Г. Д. и др. Влияние димефосфона на основные функции почек новорожденных, рожденных от матерей с хроническим пиелонефритом с сочетанным ОПГ-гестозом //Вестник науки и образования. – 2018. – №. 14-2 (50). – С. 51-55.
7. Гойибова Н. С. и др. Функция почек у недоношенных новорожденных, родившихся от матерей с преэклампсией //Достижения науки и образования. – 2019. – №. 10 (51). – С. 59-63.
8. Малявская С. И., Лебедев А. В. Метаболический портрет детей с ожирением //Российский вестник перинатологии и педиатрии. – 2015. – Т. 60. – №. 6. – С. 73-81.
9. Гойибова Н. С., Гарифулина Л. М. Функции почек у детей с ожирением //Вопросы науки и образования. – 2020. – №. 26 (110). – С. 51-57.
10. Гарифулина Л. М., Ашурова М. Ж., Гойибова Н. С. Состояние здоровья детей с различными типами ожирения //Молодежь и медицинская наука в XXI веке. – 2018. – С. 35-37.
11. Гарифулина Л. М., Гойибова Н. С., Ибрагимова Ю. Б. МЕХАНИЗМИ ПОПРЕЖДЕНИЯ ПОЧЕЧНОЙ ГЕМОДИНАМИКИ У ДЕТЕЙ С ЭКЗОГЕННО-КОНСТИТУТЦИОНАЛЬНИМ ОЖИРЕНИЕМ //Research Journal of Trauma and Disability Studies. – 2024. – Т. 3. – №. 5. – С. 136-141.
12. Maratovna G. L., Salimovna G. N., Batirovna I. Y. Status of Renal Hemodynamics in Children and Adolescents with Obesity //Research Journal of Trauma and Disability Studies. – 2024. – Т. 3. – №. 5. – С. 142-145.
13. Гойибова Н. С., Гарифулина Л. М. SEMIZLIGI BOR BOLALARDA BUYRAKLAR VA ULARNING FUNKSIONAL HOLATI //Журнал гепато-гастроэнтерологических исследований. – 2022. – Т. 3. – №. 1.
14. Гарифулина Л., Гойибова Н., Тураева Д. Оценка факторов риска наследственности и образа жизни детей и подростков с ожирением и артериальной гипертензией //Журнал вестник врача. – 2018. – Т. 1. – №. 1. – С. 39-43.

15. Гойибова Н. С., Тураева Д. Х., Холмурадова З. Э. Показатели сосудистой системы у детей с хроническим пиелонефритом на фоне уратурии //Children's Medicine of the North-West. – 2020. – Т. 8. – №. 1. – С. 109-110.
16. Salimovna G. N. METOBOLIK SINDROMLI BOLALARDA BUYRAKLARNING FUNKSIONAL HOLATI //ЖУРНАЛ ГЕПАТО-ГАСТРОЭНТЕРОЛОГИЧЕСКИХ ИССЛЕДОВАНИЙ. – 2022. – №. SI-1.
17. Maratovna G. L., Salimovna G. N., Zhamshedovna A. M. FEATURES OF KIDNEY DAMAGE IN CHILDREN WITH OBESITY //Galaxy International Interdisciplinary Research Journal. – 2022. – Т. 10. – №. 6. – С. 445-453.
18. Maratovna G. L., Salimovna G. N. Functional State of Kidneys in Children and Adolescents with Obesity //EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE. – 2024. – Т. 4. – №. 5. – С. 12-16.
19. Гарифулина Л., Гойибова Н. ОСОБЕННОСТИ ПОЧЕЧНОЙ ГЕМОДИНАМИКИ У ДЕТЕЙ С ЭКЗОГЕННО-КОНСТИТУТЦИОНАЛЬНИМ ОЖИРЕНИЕМ //Евразийский журнал медицинских и естественных наук. – 2024. – Т. 4. – №. 5. – С. 119-125.
20. Farrukh S. ORGANIZATION OF DIGITALIZED MEDICINE AND HEALTH ACADEMY AND ITS SIGNIFICANCE IN MEDICINE //Science and innovation. – 2023. – Т. 2. – №. Special Issue 8. – С. 493-499.
21. Гарифулина Л. М., Гойибова Н. С. СОСТОЯНИЕ ПОЧЕЧНОЙ ГЕМОДИНАМИКИ У ДЕТЕЙ С ОЖИРЕНИЕМ //Research Journal of Trauma and Disability Studies. – 2024. – Т. 3. – №. 5. – С. 130-135.
22. Джураева З. А., Аликулов Х. Р., Гойибова Н. С. СОДЕРЖАНИЕ МИКРОЭЛЕМЕНТОВ В БИОСРЕДАХ ОРГАНИЗМА У МЛАДЕНЦЕВ //Молодежь и медицинская наука в XXI веке. – 2018. – С. 44-45.
23. Гойибова Н. ПОВРЕЖДЕНИЯ ПОЧЕК У ДЕТЕЙ ПРИ ОЖИРЕНИИ //Журнал гепато-гастроэнтерологических исследований. – 2020. – Т. 1. – №. 3. – С. 72-76.
24. Гарифулина Л., Гойибова Н. Ожирение как фактор риска при повреждении почек у детей //Журнал гепато-гастроэнтерологических исследований. – 2021. – Т. 2. – №. 3. – С. 82-85.
25. Maratovna G. L., Zhamshedovna A. M., Salimovna G. N. Characteristic of the cardiovascular system in children and adolescents at obesity in accompanience of arterial hypertension //CUTTING EDGE-SCIENCE. – 2020. – С. 33.
26. Salimovna G. N. METOBOLIK SINDROMLI BOLALARDA BUYRAKLARNING FUNKSIONAL HOLATI //ЖУРНАЛ ГЕПАТО-ГАСТРОЭНТЕРОЛОГИЧЕСКИХ ИССЛЕДОВАНИЙ. – 2022. – №. SI-1.