

ANTIBIOTIC RESISTANCE AS A CHALLENGE TO THE GLOBAL COMMUNITY: THE VIEW OF A CLINICAL PHARMACOLOGIST

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Abstract. *Urinary tract infections are prevailing among the infectious diseases in the Russian Federation. Therefore, it is necessary to study the structure of pathogens of urinary tract infections, the characteristics of the appointment of antibacterial drugs and the rationality of their use.*

Keywords: *urinary tract infections, urolithiasis, antibacterial drugs, antibiotic resistance.*

Urinary tract infections are prevailing among the infectious diseases in the Russian Federation. They are responsible for about 60-70% of all urinary tract disorders. They are the cause for the decline in the quality of life and incapacitation of the population.

Urolithiasis is the most common disease in urological practice: in the developed world, 400000 people out of 10 million people suffer from urolithiasis [1].

In the Russian Federation in 2017, the incidence of urolithiasis was more than 700 people per 100 000 population, and its increase over the past 12 years exceeded 34% [2].

In the Voronezh region, relative to the incidence of urolithiasis, there is a steady increase in the level of general morbidity (about 500 cases per 100000 population). The annual proportion of urolithiasis in the Voronezh region increases (up to 8.1%) in comparison with the overall of the morbidity of urogenital system of the population [3, 4].

According to the increase in the incidence, there is also a rise in hospitalization of people of working age, which causes high costs for diagnosis and treatment in this group of patients.

The aim of the research is to assess the validity of the administration of antibacterial drugs in patients with acute urolithiasis.

Research materials and methods: retrospective analysis of 150 case histories of patients hospitalized in the Urological Department of Voronezh Emergency Care City Clin-

ical Hospital № 10 with a diagnosis of urolithiasis in 2019.

Results. The analysis of 150 case histories showed the dependence of those admitted to Voronezh Emergency Care City Clinical Hospital № 10 in 2019 with a diagnosis of urolithiasis and those who had positive results of bacteriological urine culture.

Chronic pyelonephritis (31%), diseases of the cardiovascular system (31%) and diabetes mellitus (10%) prevailed among comorbidities in patients with urolithiasis. 35% of patients were hospitalized without comorbidities.

The analysis of the material taken for bacteriological examination was performed: before taking antibacterial drugs, bacteriological urine culture was performed in 21% of patients. The test material was taken on the day of admission to the hospital in 3% of patients, on the second day of hospitalization – in 59%, on the third and subsequent days – in 38%.

Among the total number of positive results, the dominant microflora in 2019 is *E. Coli*-37%, *Klebsiella pneumonia*-17%, *Enterococcus faecalis*-16% and *Enterococcus spp.* - 12%. In a small amount, there are *S. saprophyticus* - 6%, *Pseudomonas aeruginosa* - 4%, *Proteus mirabilis* – 4%, *Enterobacter* – 2% and *S. epidermidis* – 2%.

When analyzing *E. coli* crops, the degree of bacteriuria was 104-105 of colony forming unit (CFU) was 35%, 106-108CFU-58%. For this pathogen, there is a high level of resistance against ampicillin and ciprofloxacin

– 61%, respectively. While maintaining sensitivity to amikacin-87%, gentamicin-75%, nitrofurantoin-86%, cefepim-61% and Meropenem-100%.

Klebsiella pneumonia was the second most frequently detected pathogen for urinary tract infections. The degree of bacteriuria was 104-105 of CFU was 36%, 106-108 of CFU-64%. *Klebsiella pneumonia* is characterized by resistance to ampicillin (100%), ciprofloxacin (78%), nitrofurantoin (93%), and ceftazidim (64%) in Voronezh Emergency Care City Clinical Hospital № 10. The highest level of sensitivity of this pathogen is typical for amikacin-64% and Meropenem-86%.

You should also pay attention to the *Enterococcus faecalis* found in bacteriological examination. The degree of bacteriuria 104-105 of CFU was 62%, 106-108 of CFU-48%.

Isolated strains of *Enterococcus faecalis* had resistance to ciprofloxacin – 77%, levofloxacin-75% gentamicin-75%. This pathogen remained sensitive to nitrofurantoin-88%.

Despite the resistance data in this hospital, the majority of patients with acute urolithiasis received Ceftriaxone (86%) and ciprofloxacin (9%) in a small amount.

After evaluating the results of the General blood test and the General urine test, it was noted that 29% of patients admitted to the urological Department had no signs of an in-

flammatory reaction, that is, they had white blood cell counts within the normal range. Of these patients, 81% received antibacterial treatment, which does not meet the latest clinical recommendations for antimicrobial therapy of urinary tract infections.

Conclusions: 1. In most cases, the initial antibacterial therapy is prescribed before the bacteriological study of the resistance of microorganisms, which not only reduces the effectiveness of treatment, but also leads to the development of antibiotic resistance.

2. The test material is taken on the second, third and subsequent days of hospitalization, that is, after the use of antimicrobial drugs, which leads to a decrease in the reliability of this result.

3. When prescribing antibiotic therapy, the local data on the structure of pathogens and the level of antibiotic resistance are not taken into account.

4. No attention is paid to the indicators of the systemic inflammatory response, which, being within the norm, indicate the need to avoid the appointment of antibiotics.

5. Thus, an important aspect is the development of protocols for the management of patients with urolithiasis, including the timing of material collection, determining the level of bacteriuria in CFU, taking into account the resistance and analysis of the inflammatory response of the body.

References

1. Shoag J., Tasian G.E., Goldfarb D.S., Eisner B.H. The New Epidemiology of Nephrolithiasis / *Advances in Chronic Kidney Disease*, 2015, V. 4, pp. 273–278.
2. <https://stomfaq.ru/socialeno-znachimie-v2/index.html>
3. Zolotukhin O.V., Lozinsky M.V., Kocherova E.V. Minimally invasive methods of treatment of urolithiasis / *Medicine and ecology*, 2018, № 4, pp. 83-86. (in Russian).
4. On the state of sanitary and epidemiological welfare of the population in the Russian Federation in 2018: State report / Moscow: Federal service for supervision of consumer rights protection and human welfare, 2018, pp. 160. (in Russian).

АНТИБИОТИКОРЕЗИСТЕНТНОСТЬ КАК ВЫЗОВ МИРОВОМУ СООБЩЕСТВУ: ВЗГЛЯД КЛИНИЧЕСКОГО ФАРМАКОЛОГА

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***Аннотация.** Антибиотикорезистентность занимает значительное место при инфекциях мочевыводящих путей, в частности при обострении мочекаменной болезни. Поэтому у пациентов с обострением мочекаменной болезни необходимо изучить структуру возбудителей инфекций мочевыводящих путей, оценить особенности назначения антибактериальных препаратов и рациональность их использования. Кроме того, способствовать оптимизации антимикробной терапии с учетом локальных данных по резистентности возбудителей к антибактериальным препаратам.*

***Ключевые слова:** инфекции мочевыводящих путей, мочекаменная болезнь, антимикробные препараты, антибиотикорезистентность, антибиотикочувствительность.*