

Most Common Side Effects Of Antibacterial Drugs In The Treatment Of Bacterial Infection

Mavlyanova Nozima¹, Mamatova Nodira², Agzamova Nazifa³, Muxitdinova Mavjuda⁴,
Sherova Zebo⁵, Buranova Dilfuza⁶, Muxammadjanova Madina⁷

^{1,2,3,4,5}Tashkent Pediatric Medical Institute

⁶Tashkent state Dental Institute

⁷Peoples ' Friendship University of Russia

¹mavlyanova.nozima@tpmi.uz, ²nodira.mamatov@yahoo.com, ³agzamova.nazifa@tpmi.uz
⁴muhitdinova.mavjuda@tpmi.uz, ⁵sherova.zebo@tpmi.uz, ⁶buranova-dilfuza@tsdi.uz
⁷muhammadjonova.dilf@pfu.ru

Abstract: Primum non nocere is a principle proclaimed by Hippocrates and remains relevant throughout the history of medicine. Unfortunately, pharmacotherapy does not always correspond to it. Although modern oral antibacterial drugs generally have a favorable safety profile, there are still many side effects. Antibacterial, like all medicines, have side effects, some of the side effects can be serious and some are dire. The use of antibacterial drugs in all areas of medicine, often unreasonable indications for their use, free access for the potential consumer - all this leads to irrational use of drugs, starting from an early age. More than 50% of diseases are infectious in nature. Infectious drugs account for 20% of all drugs currently used in medicine. The misuse of antibiotics is fraught with the development of antimicrobial resistance in the pathogen.

Keywords: side effect, antibacterial, drug, infection, health

1. INTRODUCTION

The structure of side effects of antibacterial drugs has been studied. The analysis of reports of adverse reactions to antibiotics received by the Regional Center for the Study of Side Effects of Drugs in the period from 2005 to 2011 was carried out. An increase in the number of adverse reactions during therapy with antibacterial agents is associated with their irrational use, often with the appointment of maximum doses, an unjustified increase in the course of treatment and the frequency of use of drugs. Side effects can cause critical conditions. Mortality from adverse reactions ranks 4th after mortality from cardiovascular and oncological diseases and injuries [1]. In addition, adverse drug reactions lead to additional costs for hospitalization, treatment and rehabilitation of patients [2].

2. MATERIALS AND METHODS:

Analysis of literature data on pharmacotherapy with antibacterial drugs was done.

3. RESULTS

Antibacterial, like all medicines, have side effects, some of the side effects can be serious and some are dire. The use of antibacterial drugs in all areas of medicine, often unreasonable indications for their use, free access for the potential consumer - all this leads to irrational use of drugs, starting from an early age. More than 50% of diseases are infectious in nature. Infectious drugs account for 20% of all drugs currently used in medicine. The most important among these drugs are antibiotics. The basic rules for the use of antibiotics (and others against infectious agents) were formulated by Paul Ehrlich and Alexander Fleming. According to statistics, drugs show their harmful effect in 19-20% of outpatients and in 25-50% of patients undergoing intensive therapy. Moreover, in 0.5% of cases, these harmful effects of drugs are life-threatening, and in 0.2% of patients they lead to death. In accordance with the currently accepted WHO definition, side effects of drugs include "any reaction to drugs, harmful or undesirable for the body, which occurs when it is used for the treatment, diagnosis and prevention of a disease." [3]

Antibacterial drugs occupy one of the leading places in the development of complications and side reactions, causing, according to some data, up to 37.2% of all drug complications. [6]

Allergic complications account for the largest share of side effects, followed by gastrointestinal lesions. Insufficient alertness of clinicians and the absence of mandatory registration of drug complications does not allow establishing the true scale of the effects.

Antibiotics are one of the most commonly prescribed drugs today for treating bacterial infections, which, unlike viruses, usually do not go away on their own. And while research shows that they are often taken by patients who don't really need them, doctors believe that, when used correctly, drugs are an extremely important and often life-saving part of modern medicine. But like all medicines, antibiotics can have side effects.

The most dangerous side effects of antibiotics are associated with allergic reactions. In fact, allergic reactions to antibiotics are one of the most common reasons people end up in emergency rooms. The body becomes covered with a rash or hives, lips swell or suffocation begins. With a severe anaphylactic reaction, a person's throat swells, and he needs a dose of adrenaline to save his life. These reactions are rare, but they definitely deserve attention, especially if a new drug is prescribed that has not been used before. Allergy to one type of antibiotic does not preclude allergies to other types.

One of the most common complaints from patients taking antibiotics is gastrointestinal problems such as nausea, vomiting, and diarrhea. This happens when the antibiotic has killed the good bacteria in the gut, and the bad bacteria have multiplied. This condition can lead to dehydration and requires hospitalization, so be aware of it. Drinking plenty of fluids and fiber can help before treatment ends. Antibiotics can also cause an overgrowth of bacteria in the small intestine, which can contribute to bloating and spasms that continue even after the drug is stopped. And in children recently, according to WHO, more and more importance is attached to antibiotic-associated diarrhea (AAD) [5]. Another common complaint of people taking antibiotics is headaches, and these are usually temporary headaches and any analgesic can help.

Sun sensitivity

Some antibiotics are photosensitizers, meaning they affect how the skin reacts to UV light. Exposure to sunlight can increase the chance of burning, peeling, and subsequent damage to skin cells. Some of the drugs, when exposed to sunlight, can cause a red, itchy rash in as little as 15 minutes outside. This is why people taking tetracyclines, fluoroquinolones, and sulfonamides should avoid prolonged periods of sun exposure, especially sun exposure, especially between 10:00 and 14:00, and be sure to use sunscreen as well as protective

clothing. Antibiotics can reduce or change the effect of other medicines. Drugs that can interact with antibiotics include: anticoagulants, antacids, antihistamines, anti-inflammatory drugs, psoriasis drugs, diuretics, antifungals, steroids, diabetes medications, muscle relaxants, migraine medications, and some antidepressants.

Hormonal contraceptives may also be less effective when used with an antibiotic, and if the antibiotic causes vomiting, it is possible that the contraceptive pill may not be fully absorbed. It is also worth noting the effect of antibiotics with each other, for example, when different groups of antibiotics are simultaneously prescribed to one patient at the same time, and that with the simultaneous administration of more than two antibiotics, antagonism between them is easier to manifest and the risk of undesirable effects significantly increases. This can be schematically represented in the form of a table for their correct combination with each other.

[2]. Fluoroquinolone antibacterials are among the most commonly used broad-spectrum antibacterials and are popular choices for the treatment of common conditions such as pneumonia, bronchitis, and urinary tract infections. For example, the popular antibacterial drug ciprofloxacin from the group of fluoroquinolones damages the genome - it destroys the DNA of mitochondria - the "energy stations" of body cells. Mitochondria have their own small genome, which requires enzymes called topoisomerases to maintain it. Topoisomerases regulate the topology of DNA in mitochondria, but fluoroquinolones kill pathogenic bacteria by inhibiting their DNA gyrase (a special type of topoisomerase), and at the same time they inhibit topoisomerase 2 of our own mitochondria, preventing the replication of the mitochondrial genome. After taking the ciprofloxacin medication, cell growth and differentiation is blocked. And also, a disruption in the production of mitochondrial energy. The most serious adverse effects of ciprofloxacin treatment are sensorimotor poly neuropathy, tendon damage including pain (tendonitis), trauma (tendinopathies), or even tears.

In 2016, the FDA advised that fluoroquinolones should only be used as drugs of last choice and added a warning about the risk of tendonitis as well as permanent nerve damage. Because antibiotics alter the microbiome, they make the body vulnerable to yeast infections and other types of fungi. Fungal infections can occur in the mouth (stomatitis), on the skin or under the nails, and can disrupt the balance of bacteria in a woman's vagina, altering its pH environment. Studies have shown that tetracyclines can cause irreversible staining or discoloration of permanent teeth in children. As a result, since 1970, all drugs in this class have been issued with a warning sign that does not recommend their use in children under 8 years of age (taking these drugs during pregnancy is also associated with stains on the teeth of the unborn child). Research published in 2009 found that the use of fluoroquinolones is also associated with double vision, known as diplopia. Researchers found 171 cases of this disorder among fluoroquinolone users between 1986 and 2009, with an average time of 9.6 days between onset of medication and onset of symptoms. Since this type of antibiotic has also been associated with tendinitis, the authors suggested that pain and muscle spasm around the eyes may be the cause of this additional side effect [7].

A 2015 study in the journal *Clinical Psychiatry* found that the more courses of antibiotics a person receives throughout their life, the more likely they are to develop depression and anxiety. Researchers speculate that antibacterial drugs alter the composition of the body's microbiome, which impairs the condition of nerves, metabolism and immunity - all of which can affect a person's mental health. These are just a few of the reasons why antibiotics should only be taken as needed and only as directed by a doctor, apart from the growing threat of antibiotic-resistant bacteria, which is partly exacerbated by over-prescribing.

4. DISCUSSION:

Meibomian gland dysfunction has been identified as the most common cause of dry eyes [11]. Currently available treatments are mainly palliative solutions, often insufficient to improve clinical signs and overcome patient's discomfort symptoms. Intense pulsed light was recently introduced in the field of ophthalmology and clinical studies showed that it is able to provide an improvement of both signs and symptoms in MGD patients [12-14]. IPL can be performed in conjunction with other therapies, like meibomian gland expression, and thus also represents a promising complementary treatment for MGD [15-19]. This combination of treatments allowed for the successful management of refractory cases of MGD, as demonstrated in a recent multicenter prospective study [7]. It was also demonstrated that the treatment reduces consistently also tear inflammatory cytokines [20]. Although different speculative pathophysiological theories have been proposed to explain the positive effects of IPL upon dry eye signs and symptoms, the mechanisms of actions are still not fully elucidated. Among these, the coagulation of superficial blood vessels and telangiectasias of eyelids skin induced by light energy, the heating and liquefying of meibomian glands secretions with improved viscosity and outflow, and the decrease of bacterial and parasitic load over eyelids and eyelashes have been proposed [21,22]. More recently, the enhancement in collagen synthesis and connective tissue remodeling, the reduction in skin epithelial cell turnover, and the modulation of cellular inflammatory markers have also been hypothesized [19]. To date, most of the available studies reported improvements in terms of lid margin features (e.g., thickening and vascularity, telangiectasia, number of plugged glands) and meibomian gland secretion quality and expressibility [19]. However, these measures are subjective, and prone to observer bias due to a low degree of standardization. Conversely, a comprehensive ocular surface workup with automated quantitative measurements may overcome these drawbacks, thus improving the objective monitoring of the disease course after treatment [23]. In the present study, we showed a significant increase of LLT by using the same grading scale previously utilized by Craig and collaborators [7, 25]. Nevertheless, it should be noted that in our study, as in other MGD populations, the values of the tear meniscus height were within the upper range of normality [13]. The area of MGL did not change after IPL treatment. This finding is in contrast with the only study evaluating before this parameter, which reported a 5% decrease of MGL after IPL in treatment-naïve patients [10]. However, this finding is controversial since a similar improvement was noted in the same study also in control patients treated with eyelid hygiene alone.

5. CONCLUSION

Thus, from the above data, it should be remembered that not all errors in the use of antibacterial drugs lead to a deterioration in the patient's well-being. And the misuse of antibiotics is fraught with the development of antimicrobial resistance in the pathogen. In the light of the fight against the formation of antibiotic resistance, especially in pediatric practice, one must always remember that the appointment of antibiotic therapy should be carried out by a doctor and only according to strict indications, with the obligatory conduct of courses of treatment adequate in duration and doses.

Conflict of Interest

The authors have no conflicts of interest associated with the material presented in this paper

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