**Side effects of a group of antibiotics, the most used for periodontal treatments**

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**Abstract**

**Purpose:** For treatment of periodontal diseases are preferred antibiotic combinations, with the aim of hitting bacterial flora, according to its characteristics, aerobic anaerobic, gram-negativ and gram-positiv, with certain antibiotics that act on certain bacteria. The aim of the study is analyzing the side effects of the used antibiotics.

**Materials and methods:** From literature are gathered datas on the side effects (preferably expressed in percent) of some antibiotics, the favorites in periodontal recipes. These data are sorted by determining antibiotic.

**Results:** In the case of providing periodontal prescription, patient is in risk for 5% allergy, 3% nephritis, hematological problems 2-2.5%, 5.5% gastrointestinal problems, 2% disturbance in the nervous system, 5.5% allergic signs on the skin, problems with electrolytes displayed in minor of %. Interaction with different medications is present in almost all cases! Touching the body systems is in total of 4%, the maximum value is expressed in the skin, the minimum value on the nervous system.

**Conclusions:** Cross allergies is in high value, because of the expressed structural similarity of antibiotics! Giving a recipe, we've balance the % of side effects, the % of bacterial resistance and the % of the success of the recommended dose of antibiotics.

**Keywords:** antibiotic, via side effects, periodontology.

 **Entry**

 Periodontal illnesses, as a group of illnesses that are caused by a combination of bacteria and oral variable bacterial flora, require not only local treatment, at dental clinics, but in special cases, associated with oral antibiotic combination, with systemic action. According to oral pathologies, it can be given prescription only one antibiotic, or a combination of antibiotics. The whole difference between these two forms of recipes exists in dosages of antibiotics. Single antibiotic to recipes, we prefer a dose of 500mg, for two antibiotics prescriptions, dosages reduced to 250mg, for each antibiotic in the combined group of antibiotics. Antibiotic combinations are preferred to be used with the intention of hitting bacterial flora, according to its characteristics, aerobic anaerobic, gram negative and gram positive, with certain antibiotics that acts on certain bacteria. Each of the selected antibiotic is effective only in case when it is completed the total periodontal curettage, otherwise, you can pass gradually to the diagnosis of refractory periodontitis. According to a study on the effects of combined antibiotics, amoxicillin and metronidazole, after complete curettage; application of antibiotics leads to much better clinical results, compared to periodontal treatment, only with mechanical curettage.

According to this study again, this combination of antibiotics fights *T.forsythia*, in a manner to prevent the re-colonization, up to 6 months after treatment. This element provides stability thought impairments expectancy of periodontal treatment.(1) The combination of periodontal microbiology and antibiotic therapy, qualifies as a normal extension of periodontal treatment, followed by proper clinical diagnosis.(2)

**Materials and methods**

 From literature are collected data on the side effects of some antibiotics, preferably expressed in percent, the most citing at the periodontal recipes. These data are listed according to the used antibiotic.

Amoxicillin causes hyper-sensitiveness in application realized by the crosses reaction and sensitivity towards degradation products with alkaline hydrolysis. Allergic reaction to penicillin goes to the limits of 5-8% values, against penicillin anaphylactic shock occurs in the interval 0.05%.(3) Nephritis, eosinophilia, hemolytic anemia are other side effects that may be associated with typical oral lesions. Nause, vomiting, diarrhea, gastrointestinal problems appear in case of application of portions of the oral dose. Vaginal candidiasis often caused by the application of ampicillin and amoxicillin.

Cephalosporins exhibit hypersensibility that is in the same rhythm as to penicillins. Chemical structure differs somewhat from penicillins cephalosporins, and penicillins against allergic patients may not exhibit hyper-sensitiveness of cephalosporins. Allergic reactions go to figures 5-10%. Intravenous injection of cephalosporins can cause tromboflebite, renal toxicity, hemorrhagic disorders, which are the same problems.

Tetracycline has gastrointestinal side effects, nausea, vomiting, diarhea. Tetracycline modifies normal intestinal flora inhibiting coliform organisms and allow overproduction of *Pseudomonas*, *Proteus*, *Clostridium*. Vaginal candidiasis associated with taking tetracycline.(4) Tetracycline is fixed to the structure of the newly formed teeth, if taking the drug during certain periods of pregnancy, the fetal age of creation. Liver toxicity occurs in cases where patients have been previously hepatic insuficense, or when tetracycline is given intravenously. Tetracycline renal toxicity occurs when given together with diuretics, after performing nitrogen retention products. Local tissue toxicity appears with venous thrombosis. Sensitivity to light is another side effect. Nausea, dizziness occur in 35-70% percent.(4)

Macrolides have gastrointestinal effects, such as gastrointestinal intolerance, which relates to the stimulation of bowel motility. They may provide acute hepatitis with fever, jaundice. Most patients can be improved after discontinuing the drug, but may re-appear after re-claims his administration. Allergic reactions include fever, eosinophilia and rash. Macrolides may increase serum concentrations of many drugs such as theophylline, oral anticoagulants, cyclosporin and metilprednizolon. Erythromycin increases plasma concentrations of oral digoxin, increasing its bioavailability.(4)

Azithromycin differs from erythromycin, from klaritormicina, due to pharmacokinetic characteristics. A dose of 500mg azithromycin provides lower plasma concentrations of 0.4mikrog/ml. Azithromycin penetrates well in most tissues except the brain fluid, 10-100 times higher than plasma concentrations. Tissue half-life is 2-4 days and ensures elimination half-life of approximately 3 days. These properties allow the granting of azithromycin once a day and shortening the duration of therapy. It should be taken 1 or 2 hours before meals. It does not inter-act with other drugs, unlike erythromycin and clarithromycin. (4)

Antiprotozoal as metronidazole, is more powerful antibacterial activity against anaerobes, *clostridium*. The 250 mg oral dose penetrates the cerebrospinal fluid. Matronidazole metabolized in the liver. Bacterial vaginosis is well treated with metronidazole. Nausea, diarrhea, stomatitis, neutropenia were the most frequent side effects. Metronidalzole offers to periodontolog dentist, the degree of efficiency advantages and relatively the minor light side effects. It is the antibiotic against which, suspects are still in clinical development of resistance.(2)

**Results**

For penicil, these are the efficiencies registered:
 - non-toxic
 - anaphylactic allergic reaction, IgE 10%, utikarie-rash, eosinophilia 1-2% 6-9%,

 late reaction of IgG/IgM: 1-5%
 - nephritis, fever, eosinophilia, hematuria: 1-2%
 - haematological reactions, hemolytic anemia, imunotrombocitopenia,

 leukopenia 1-5%
 - nervous system: epileptogen action, encephalopathy
 - gastrointestinal system: diarrhea, pseudomembranous colitis, disbakterosis
 - crosses allergy 10%
 - problems in the balance of electrolytes (Na, K).
Broad spectrum antibiotics are not indicated to epileptic women, who use oral contraceptives.(3)
Cephalosporins have been registered for the following data:
 - non-toxic, side effects 1-10%
 - allergies, hives, morbiliphorme signs, eosinophilia: 1-2%
 - gastrointestinal problems 4%
 - 2% haematological reactions
 - intolerance to alcohol

 - nephrotoxicity, allergic interstitial nephritis.
They are indicated in cases of: female genital organ infections, meningitis, urination airway infections, infections of the skin, and for surgical prophylaxis. Interaction with drugs: theophylline, streptomicin.
Tetracycline, based at datas provided by the literature, it appears that:

 - it causes the coloring of the teeth
 - gastrointestinal disorders
 - rare allergy
 - fotosensibilitet
 - nitrogen retension, progressive uremia.
Interactions with medications: kumarina.
Erythromycin, for the side effects is as follows:
 - gastrointestinal problems occur in 3-4%.
 - 1-2%, allergenic skin

 - problems of central nervous system 1-2%.
Ps. It is indicated in allergic patients to penicillin!
Interaction with other medications: with theophylline.
 Klindamicina has side effects like neutropenia, diarrhea, nausea, enterocolitis.
Klindamicina displayed with the following information: 10% in the skin allergy, gastrointestinal disturbances occur in about 11% of cases.

Indicated in the case of allergic patients to penicillin, erythromycin post secondary opportunities! It is indicated for the treatment of acne, osteomyelitis! Interactions with medications: theophylline. Simultaneous should avoid giving the diuretic furosemide, or other antibiotic vancomycin, after they empower nefrotoksicitet. Auditory damage, vertigo, ataxia and loss of balance, there are other side effects.
No drug, side effects appear to those as follows: affects the gastrointestinal system with consequences nausea, vomiting, diarrhea, to the nervous system, peripheral neuropathy, encephalopathy, hallucinations, etc.; intolerance to alcohol, associated with the emergence of metal unsatisfactory taste in the mouth, and the brown coloration of urine!
Carbapenem-et displayed with the following side effects:
 - gastrointestinal disturbances, vomiting, nause 4%, 3% diarrhea,

 pseudomembranous colitis 0.16%
 - appear on the skin allergy, the extent of 2,7%
 - nervous system disturbances occur at 3%
 - hematological problems appear in the mass 0.3%.

Side effects are estimated at the time of the analysis of antibiotic therapy indications, indications for the purpose of therapy or prophylaxis.

Side effects are caused because antibiotics are foreign materials in the body. They have chemical structures that can cause toxic effect. They can cause allergies by line of IgE. As foreign material in the body, also it is expressed his biological effect, but in the body.

**Discussions**

 On granting of antibiotics it is best to rely on diagnostic microbiology. This means must be found sensitivity of certain bacteria to antibiotics. So we are convinced on adequate antibiotic effect. Plaque and biofilm must be removed mechanically, before giving antibiotics.(5) If antibiotics are not selected properly, dealing with microorganisms oral protection mechanisms with sophisticated for the survival of the species, allowing higher pathogenicity, transfer of genetic material for increased virulence and antibiotic resistance to oral microflora.(6) In cases of periodontal treatment, this type of control is difficult, because the laboratory conditions for planting and microbiology diagnostic oral bacterial flora, is incomplete. Prescription of antibiotics is carried out on the basis of data obtained from periodontal clinical examination of the patient. Clinical examination reveals about the presence of certain bacteria, such as changing the color of the plaque. It is known that plaque typical color changes depending on what bacteria or bacterial compound are inclusions in the structure of plaque. Color ranges from white, yellow, green, orange cherry coffee. This color fluctuations presence of bacteria expressing specific tile, that gives color. Knowing the characteristics of bacteria and compared the sensitivity, also perform a combination of antibiotics. We strive for broad-spectrum antibiotic to combine with narrow spectrum antibiotics, and further a field with the element of fighting as aerobic, and anaerobes. However, oral antibiotic that is taken, after absorption, gives his reaction to the systemic throughout the organs, that is the road that takes him hematological antibiotic in the gingiva and other organs. Doses of certain antibiotics express its concentration in the area of ​​gums. Besides the positive effect of the antibiotic may also be encountered side effects expressed in organs and other systems of body.
Based on the above data, about side effects of antibiotics applied to periodontal disease, achieve the result that, in the case of providing a prescription of patient risk for:
 - 5% allergy
 - 3% nephritis
 - 2-2.5% hematological problems
 - 5.5% gastrointestinal problems
 - nervous system disorders 2%
 - 5.5% in the skin allergic signs
 - problems with electrolytes, displayed in% smaller.

Allergies against drugs, is expressed as main and primary complication in the amount of 5% of cases. Hematologic system, gastrointestinal, nervous system, cardiovascular system, kidney organ, is a list of issues involved in side effects.
Interaction with different medications is present in almost all cases!

Touch systems is in total 4%, the maximum value is expressed in the skin, the minimum value to the nervous system. Jade is a side effect that occurs as a result of allergic reactions in other organs, with the added value of IgG-IgM complexes (non-IgE).

Most of antibiotics associated with disorders in normal function of platelets and red blood cells. Concerns intestinal flora, necessary for the absorption of vitamin K, can lead to bleeding problems. In this sense, the % of gastrointestinal disorders is 5.5%, and affects the % appear in hematological problems (2.5%). This impact is proportional to!
Taking antibiotics affects the effects of other drugs that patients take, in the context of war-binding proteins for transport.
We stress that the nervous system disturbances, presented in lower % and only in cases of overdose of antibiotics! With the termination of the antibiotic, everything returns to normal.

Side effects are divided by class and proximity of antibiotics with each other; this linked to the similarity in their chemical structure. Not reflected the percentage of bacterial resistance to the antibiotic classes. This is because the purpose of the study was simple analysis of values ​​in% only side effects and not the effects on bacterial strains. So giving a prescription, we balance: % of side effects, % of bacterial resistance and % success based on recommended dose of antibiotics.

**Conclusions** Among the drugs, tetracycline and metronidazole were the only drugs without accurate data in percentage, about side effects! Cross allergies is in high value because structural similarity of the antibiotics! It is not reflected the percentage of bacterial resistance to the antibiotic classes, this because the purpose of the study was simple analysis of values in %, only of the side effects and not the effects on bacterial strains. So giving a prescription, we balance: the % of side effects, the % of bacterial resistance and the % of therapy success, based on recommended dose of antibiotics.

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