Efficacy of using antibacterial fusidic acid drops in patients with red eye

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Introduction. *A red eye includes various etiology diseases of the ocular surface (eyelids, conjunctiva, and cornea) as well as of the vascular tract and lacrimal apparatus, the main feature of which is hyperemia of the conjunctiva of the eye.*
The purpose *of the present study was to study the efficacy of antibacterial fusidic acid drug in patients with the red eye.*
Material and Methods. *We observed 60 patients (120 eyes) with the red eye. In case that conjunctival flora was sensitive to Futaron, the patients were prescribed the drug instillations 4 times a day for 7 days followed by repeated microbiological control. Efficacy of Futaron was determined due to terms and occurrence of pathogen eradication according to data of microbiological test of the conjunctival discharge.*
Results. *When performing the microbiology test of the conjunctival discharge, Staphylococcus epidermidis was noted in 31 patients (51.6%). Of them, after Futaron instillations, reseeding was pure in 23 patients, and staphylococcus growth continued in 8 patients (25.6%). In all twelve patients (20%) with Moraxella determined, agent eradication was achieved against the background of Futaron instillations. Streptococcus haemolyticus was detected in the culture from the conjunctiva in seven patients (11.7%). Herewith, reseeding was pure in four patients (57.2%) and staphylococcus persistence was noted in three of them (42.8%). Futaron instillations for 7 days facilitated pathogenic flora eradication in four patients (6.7%) with Escherichia coli defined and in three patients (5%) with Staphylococcus aureus.*
Conclusions. *Futaron eye drops is an effective and safe drug for treatment of red eye patients and they are most effective when Staphylococcus epidermidis and Moraxella are defined in the culture from the conjunctiva.*

Key words: red eye, fusidic acid, conjuctival micro flora

Introduction

A red eye includes various etiology diseases of the ocular surface (eyelids, conjunctiva, and cornea) as well as of the vascular tract and lacrimal apparatus, the main feature of which is hyperemia of the conjunctiva of the eye.

Being constantly in a contact with ambient environment, the ocular surface is often involved in different pathologic processes, a third of which refers to infections [3].

Hyperemia in the conjunctiva is one of the signs of general inflammation on the ocular surface. Besides, classic clinical signs and symptoms of the red eye are: pain, photophobia, tearing, blepharospasm, swelling and the presence of the discharge from the conjunctiva [3].

The most common ocular surface diseases are bacterial conjunctivitis (66.7%) and blepharitis (22.3%) [3]. It is quite often that a clinical picture is complicated by the combination of the bacterial conjunctivitis with dry eye syndrome, blepharitis, and keratitis.

Among causative agents, the most common are Staphylococcus, Streptococcus, Haemophilus influenza, Moraxella, Pseudomonas, and Neisseria gonorrhoeae [3].

To our best knowledge, prevalence rates of microbial strains resistant to antibacterial drugs increases every year. That is why a search for new medications with a wide antibacterial action is ongoing.

Over the last two decades, there has been a tendency for changes in the species composition of the conjunctiva flora towards a decrease in potentially pathogenic content [2]. Many causes occur in this regard. They include implementation of new therapeutic procedures in the eye which are used at hospital and during an outpatient visit, a launch of a great number of new antibacterial drugs which are sometimes unnecessarily prescribed to patients with a preventive purpose, and the growth in incidence of secondary immune deficiency among the population due to difficult economical and

ecological problems. On the other hand, the lack of eye specialists in polyclinics results in the fact that it may be of a problem to timely visit a specialist; this leads to self-treatment of patients, their uncontrolled using local antibacterial and hormonal medications which are freely sold at pharmacies. As a result, we can observe the growth of chronic conjunctivitis, the occurrence of antibiotic-resistant strains, and disorders in local immunity.

When they have some or other symptoms of conjunctival irritation, the patients, very often, assess their condition properly. And such symptoms as eye reddening, mild swelling, itching and burning sensation are not the reasons to attend an eye specialist. In general, all that patients can do is to visit a pharmacy with a wide range of non-prescription medications used in ophthalmology.

A rational use of medications is one of the most important factors in any disease therapy. Futaron has called our attention along with many antibacterial medications widely used to treat the red eye. This is an antimicrobial drug of fusidic acid with a bacteriostatic action which does not have transverse sensitivity to other antibacterial drugs. An active ingredient is fusidic acid belonging to a group of antimicrobic medications and derived from the fungus Fusidium Coccineum. In chemical structure, fusidic acid is tetracyclic triterpenoids. The bacteriostatic action is conditioned by disturbance of bacterial protein synthesis. Blocking the factor G elongation, fusidic acid inhibits its turnover with the ribosome and guanosine triphosphate, which interrupts energy release necessary for protein synthesis and leads to bacterial cell death. Resistance to fusidic acids develops rather rarely and slowly. Among methicillin-resistant staphylococci, strains resistant to fusidic acid are registered in different countries within the ranges of 1-6%. The following microorganisms are sensitive to fusidic acid: Staphylococcus aureus, Streptococcus pneumonia, Corinebacterium, Haemophilus influenza and Staphylococcus epidermidis (including methicillin-resistant). Enterobacteriaceae and Pseudomonas aeruginosa are resistant to the action of fusidic action. Inactive ingredients in Futaron are disodium edetate, mannitol, carbomer 940, trometamol, benzalkonium chloride, water for injections. Carbomer 940 provides a long contact with the cornea and sufficient concentration of fusidic acid in the tear fluid.

Many investigations have shown that fusidic acid highly competitive in its efficacy with such antibiotics as tobramycin, lomefloxacin, rifampicin, and chloramphenicol [5-10, 13]. Fusidic acid drug is known to be used in dacryocystitis of newborns [4, 11]. In this pathology, the drug of choice is medications with a wide spectrum of antibacterial action [1]. Simultaneously, requirements to such drugs are high in regard to safety: minimal side effects, favorable tolerability, the absence of irritating components in the drug content, optimal consistence, easiness and comfort when instilling the drops. Futaron, a fusidic acid drug, has all features listed above. E.K. Norman et al. (2002) used Fucithalmic, a fusidic acid drug in the treatment of acute neonatal conjunctivitis [11]. R. P. Rietveld et al. (2005) used 1% fusidic acid gel in the treatment of acute infectious conjunctivitis [12].

That is why the approbation of new medications which would be effective in red eye treatment and which would not induce resistance to them is of a great relevance.

The purpose of the present study was to study the efficacy of antibacterial fusidic acid drug in patients with the red eye.

Material and Methods

We observed 60 patients (120 eyes) with the red eye. Among complaints were noted eye reddening, itching, foreign body sensation and tearing. Patient's inclusion criteria were biomicroscopy data obtained during slit lamp examination: hyperemia in the conjunctiva, mucoid / mucopurulent discharge in the conjunctiva as well as a reduction of tear production, and data of microbiology investigation of the conjunctiva. The patients were diagnosed as follows: viral conjunctivitis (n = 10, 16.7%), bacterial conjunctivitis (n = 18, 30%), allergic conjunctivitis (n = 10, 16.7%), dry eye syndrome (n = 22, 36.6%). The conjunctival discharge was microbiologically tested to determine flora and its sensitivity to antibiotics and fusidic acid. In case that conjunctival flora was sensitive to Futaron, the patients were prescribed the drug instillations 4 times a day for 7 days followed by repeated microbiological control. Additionally were prescribed artificial tears in the presence of dry eye syndrome, interferon drugs in viral conjunctivitis, cromoglicic acid/olopatadine in allergic conjunctivitis. Changes in complaints, i. e. disappearing of conjunctival discharge, hyperemia in the eyeball, tearing, as well as subjective sensation of patients when instilling drops were assessed. Efficacy of Futaron was determined due to terms and occurrence of pathogen eradication according to data of microbiological test of conjunctival discharge.

Entry criteria were: 1) patients with infectious diseases of the ocular surface, aged 18-72; 2) detection of flora sensitive to fusidic acid, when performing microbiology test of the conjunctival content; 3) the ability of a patient to follow drop instillation regimen and doctor's recommendations.

Withdrawal criteria were: 1) patient's local or systematic intake of antibacterial drugs; 2) minor children, pregnant women and nurses.

Results

When performing the microbiology test of conjunctival discharge, Staphylococcus epidermidis was noted in 31 patients (51.6%). Of them, after Futaron instillations, reseeding was pure in 23 patients, and continued staphylococcus growth was in 8 patients (25.6%).

In all twelve patients (20%) with Moraxella determined, agent eradication was achieved against the background of Futaron instillations.

Streptococcus haemolyticus was detected in the culture from the conjunctiva in seven patients (11.7%). Herewith, reseeding was pure in four patients (57.2%) and staphylococcus persistence was noted in three of them (42.8%). Futaron instillations for 7 days facilitated

pathogenic flora eradication in four patients (6.7%) with Escherichia coli defined and in three patients (5%) with Staphylococcus aureus.

Besides, there was one case (1.7%) of each Enterococcus, Proteus vulgaris and Pseudomonas aeruginosa with the disappearing of flora in the conjunctiva. It should be noted that one patient had conjunctival flora sensitive to fusidic acid (Pseudomonas aeruginosa) with following positive therapeutic effect.

The patients tolerated the drug well during the course of treatment. Dry eye patients had subjective improvement in their condition with no sensation of foreign body in the eye.

When performing microbiology test, conjunctival microflora resistance to Futaron was noted in 12 patients with the red eye, in particular: Escherichia coli (n = 3), Klebsiella pneumonia (n = 2), Moraxella (n = 2), and Staphylococcus epidermidis (n = 5).

Clinical observations performed give the evidence of a positive therapeutic effect of using Futaron, which was observed in 81.7% patients with inflammations of ocular surfaces. The findings make it possible to recommend Futaron, a fusidic acid drug, for treatment of patients with the red eye.

Conclusions

1. Futaron eye drops is an effective and safe drug for treatment of red eye patients
2. The most sensitivity to Futaron was revealed when Staphylococcus epidermidis (51,7%) and Moraxella (20%) were defined in the culture from the conjunctiva.

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