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Blepharokeratoconjunctivitis

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SUMMARY

The microbes isolated in 110 in and out patients aged 1–80 years and who had blepharokeratoconjunctivitis and their sensitivity to antibiotics and chemotherapeutics were presented. Sixty samples (54.5%) showed bacterial, while 7 samples (6.3%) showed fungal involvement. In 6 samples (5.5%), bacteria and Fungus coexisted. Majority of bacterial pathogens were sensitive to common antibiotics while some commonly available antibiotics were not effective on a reasonable number of germs (tables 5 & 6). Pseudomonas aeruginosa showed the highest resistance to available antibiotics while penicillin group of antibiotics had no effect on gram negative pathogens (table 6). Staphylococcus aureus considered the most common cause of ocular infection was isolated in 5 (4.5%) samples, while staphylococcus epidermidis considered apathogenic was isolated in 16(14.5%) cases. Fusarium Spp, found in 3 (2.7%) cases was blamed for one hypopion keratitis and one endophthalmitis. Despite the use of such antibiotics and chemotherapeutics like chloramphenicol, erythromycin, tetracycline, and sulfacetamide to which the pathogens were sensitive, blepharokeratoconjunctivitis persisted. The problem of induced pathogenicity, the difficulty in reaching infection reservoirs with antibiotics, the often inadequate dosage of antimicrobes as well as geographical and environmental influences were discussed.

KEY WORDS: ***Blepharokeratoconjunctivitis, microbes, pathogenicity Abia/Imo States Nigeria.***

INTRODUCTION

The situation of ophthalmic health care delivery in many developing countries is well known. Lack of adequate diagnostic and therapeutic requirements, and the lack of adequately trained manpower worsen the situation. For many years authors have surveyed the pathogenic and the non-pathogenic microorganisms involved in both irritated and non-irritated conjunctivae. There is considerable controversy as to the criteria to be used in determining the pathogenicity of a microorganism. Some authors believed that an organism is then pathogenic when the organism is consistently parasitic on a living cell[1,2]. Others believed that because of the ability of pathogenic organisms to induce non-pathogenic ones to change their biological characteristics while still retaining essential morphology and thereby causing inflammations the question of which organism is essentially pathogenic is difficult to answer[4,5]. Important is the fact that both pathogenic and non-pathogenic ocular flora can cause inflammation depending on the circumstances. In a recent study in Abia and Imo States of Nigeria, 110 patients aged one to eighty years who were on hospital treatment for blepharokeratoconjunctivitis were investigated. It was observed that despite treatment with antibiotics and sometimes steroid combination the problem of blepharokeratoconjunctivitis persisted. The study was aimed at finding out the cause of the persistence and to suggest ways of improving the approach to treatment.

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MATERIALS AND METHODS

Iid, conjunctival and corneal smears were collected from hospital in and out patients who presented with blepharitis, conjunctivitis and keratitis. Total number was 110. Clinically, one patient had endophthalmitis and 3 had hypopyon keratitis. The smears were transported under sterile conditions and by a temperature of 8 –10 degrees to the hygiene institute of the university of Graz- Austria. Within one week of collection, samples were cultured for infective organism and was assessed for sensitivity to various antibiotics and chemotherapeutic on blood agar, macconkey agar, and sabourboud agar. Several bacterial strains were gram stained and microscopy

done. Biochemical tests and special medium were used for further classification of spores, corynebacterium, fusarium and candida.

RESULTS

In 60 (54.5%) samples bacteria alone were found. Thirty one (28.2%) showed mixed bacteria. In 7(6.5%) cases fungus alone was identified. Six cases (5.5%) showed mixed bacteria and fungi, while 6(5.5%) samples were sterile (table 1). Gram positive bacterial pathogens were found in 32 (29.0%) sample (table 2). Staphylococcus aureus considered the most common cause of ocular infection was found in 5(4.5%), while staphylococcus epidermidis considered apathogenic was found in 16(14.5%) samples (table 2). Gram negative bacterial pathogens were found in 58(52.6%) samples (table 3). Pseudomonas aeruginosa isolated in 4(3.6%) samples, caused corneal ulceration in 2 cases. Fungal growth was found in 14(12.6%) samples table 4. Candida albicans 4(3.6%) and Fusarium spp 3(2.7%) featured prominently in blepharokeratoconjunctivitis. Betalactamase resistant-cephalosporin, aminoglucoside, and gyrase inhibitor groups of antibiotics were found to be more sensitive on gram negative pathogens than the penicillin group which were not effective on the gram negative pathogens (table 6). Some commonly available antibiotics and chemotherapeutic agents like tetracycline, chloramphenicol, erythromycin, and sulfacetamid were effective on gram positive pathogens in some cases. The penicillin group of antibiotics though sensitive on the gram positive pathogens were not used topically. The exception was penicillin eye ointment from ICN Galenika Belgrad Yugoslavia which was a nuisance to the eye in most patients (table 5).

Table 1: ***Microbes isolated in 110 samples of blepharokeratoconjunctivitis***

Microbes	No	Percentage
Bacteria only	60	54.5%
Mixed bacteria	31	28.2%
Fungus only	7	6.3%
Fungus + bacteria	6	5.5%
Sterile	6	5.5%

Table 2: ***Gram-positive bacterial pathogens (No 32 = 29.0%)***

Pathogens	No	Percentage
Staphylococcus epidermidis	16	14.6%
Staphylococcus aureus	5	4.5%
Corynebacterium spp	3	2.7%
Entrococcus spp	5	4.5%
Streptococcus	1	0.9%
Aerobic spores	2	1.8%
Total	32	29.0%

Table 3: ***Gram negative bacterial pathogens (No 58 = 52.6%)***

Pathogens	No	Percentage
Proteus mirabilis	2	1.8%
Proteus spp	1	0.9%
Flavobacterium spp	3	2.7%
Pseudomonas spp	10	9.1%
Acinetobacter spp	12	10.9%
Klebsiella spp	6	5.5%
Pseudomonas aeruginosa	4	3.6%
Serratia spp	2	1.8%
Entrobacter	5	4.5%
Citrobacter spp	4	3.6%
Morexella spp	3	2.7%
Aerobacter	6	5.5%
Total	58	52.6%

Table 4: ***Fungal microbes (No 14 = 12.6%)***

Fungal flora	No	Percentage
Candida guillermondi	1	0.9%
Candida albicans	4	3.6%
Candida parapsilosis	2	1.8%
Mucor (moulds)	1	0.9%
Tricospores beighlii	1	0.9%
Verticillium spp	2	1.8%
Fusarium spp	3	2.7%
Total	14	12.6%

Table 5: ***Gram positive antibiogramme***

		Sensitivity									
Pathogen	**No**	**Penicilline**	**Isoxazonyl-Penicilline**	**Amino-Penicilline**	**Beta-lactamase resistant cephalo-sporine**	**Sulphac-etamide**	**Aminogl -ucosede**	**Gyrase ihibitors**	**Tetracycl -ine**	**Erythr mycine**	**Chlorom phenicol**
Staphylo-coccus Epideme-dis	16	12 + 4 -	15 + 1 -	12 + 4 -	16 +	16 +	16 +	16 +	10 +, 6 -	16 +	14 + 2 -
Staphylo-coccus Aureus	5	2 + 3 -	5 +	2 + 3 -	5 +	5 +	5 +	5 +	4 +, 1 -	3 + 2 -	5 +
Coryre-bacterium spp	3	3 +	3 +	3 +	3 +	3 +	3 +	3 +	3 +	3 +	3 +
Entrobac-terium spp	5	5 +	5 +	4 + 1 -	5 +	5 +	5 +	4 +, 1 -	5 +	5 +	5 +
Steptoco-ccus	1	1 +	1 -	1 +	1 -	1 +	1 -	1 +	1 +	1 +	1 +
Anerobic spores			Not tested								

Table 6: ***Gram negative antibiogramme***

		Sensitivity									
Pathogen	**No**	**Penicilline**	**Isoxazonyl-Penicilline**	**Amino-Penicilline**	**Beta-lactamase resistant cephalo-sporine**	**Cephato sporine**	**Aminogl -ucosid**	**Gyrase ihibitors**	**Tetracycl -ine**	**Cholo-mphe nicol**	**Sulface-tamide**
Proteus mirabilis	2	2 -	2 -	2 -	2 +2 -	2 +	2 +	2 +	1 + 1 -	1 +	
Proteus spp	1	1	1 -	1 +	1 +	1 +	1 +	1 +	1 +	1 +	1 +
Flavabac-terium spp	3	3 -	3 -	3 -	2 + 1 -	2 + 1 -	2 + 1 -	3 +	2 - 1 +	3 +	2 + 1 -
Pseudomo nas spp	10	10 -	10 -	8 -, 2 +	10 +	4 + 6 -	8 + 2 -	10 +	6 + 4 -	9 + 1 -	8 + 2 -
Acineto-bacter spp	12	12 -	12 -	11 - 1 +	7 + 5 -	11 - 1 +	12 +	8 + 4 -	6 + 6 -	8 - 4 +	10 + 2 -
Klebsilla spp	6	6 -	6 -	5 - 1 +	6 +	6 +	6 +	6 +	5 + 1 -	6 +	5 + 1 -
Pseudomo-nas Aeru-ginosa	4	4 -	4 -	4 -	4 -	4 -	2 + 2 -	4 +	4 -	4 -	4 -
Serratia - spp	2	2 -	2 -	1 - 1 +	2 +	1 - 1 +	2 +	2 +	2 -	2 +	2 +

Key to tables 5 & 6

No = number of Gram +ve/-ve samples.

$14^{+}, 2^{-}$ = 14 out of 16 samples sensitive, 2 out of 16 samples resistant.

(-) = not tested.

$1, 1^{\pm}$ = 1 out of 2 samples resistant and 1 out of 2 samples neither sensitive nor resistant.

DISCUSSION

For many years, authors have surveyed the pathogenic and nonpathogenic micro organisms involved in both irritated and non-irritated conjunctiva. In a recent study in Abia and Imo States of Nigeria, carried out in 110 in and out patients who had blepharokeratoconjunctivitis, it was observed that despite treatment with antibiotics and sometimes with corticosteroid combination, the problem of blepharokeratoconjunctivitis persisted. Tables 5 & 6 showed that a good number of the pathogens were sensitive to the antibiotic and chemotherapeutics agents while some groups of antibiotics did not work in a reasonable number of germs. Single pathogens were isolated and tested for sensitivity to the antibiotics and chemotherapeutic drugs. The gram positive pathogens were sensitive to such antibiotic and chemotherapeutic drugs like chloramphenicol, tetracycline, sulfa cetamide, and erythromycin. The gram negative pathogens were not very much sensitive to those antimicrobes. The problem of mixed infection (table 1) in the area, contributed to apparent failure of those antimicrobes though they responded to single pathogens. Self medication was relatively common. The result of this is the replacement one pathogen with another through the use of unsterile, contaminated eye drops. Duke Elolert[2] made similar observations. In his study, the incidence of dry eyes was high and this favoured the growth of micro organisms especially staphylococcus, fungus, and aerobic spores which caused chronic irritation of the conjunctiva. Some enteric gram negative pathogens (table 3) found normally in the intestinal tract as well as in air, water and soil confirmed the problem of change of environmental hygiene in the area. This would make the choice of antibiotics difficult. Many authors have observed the ability of pathogenic organisms to induce nonpathogenic ones to change their biological characteristics while still retaining their essential morphology thereby causing infection. A considerable controversy has existed as to the criteria to be used in determining the pathogenicity of micro organisms in irritated and non irritated eyes.[3,4,5,7]. The question of when and in what quantity a pathogen caused infection remained difficult to answer. The coliform group of bacteria (aerobacter, klebsiella), which have been reported as rare causes of hypopyon keratitis [3,5,7] were isolated in 6(5.5%) samples each. Hypopyon keratitis was the clinical diagnosis made in one sample. Pseudomonas aeruginosa, with its high antibiotic resistance was isolated in 4(3.6%) samples and it was the cause of corneal ulceration in 2 samples. When compared with pseudomonas spp, considered less important in conjunctivitis, the danger posed by pseudomonas aeruginosa in corneal ulcers was emphasised by the fact that among the antimicrobes tested, only the gyrase inhibitor was sensitive in all 4 samples while aminoglucoside was sensitive only in 2 out of the 4 samples (table 6). Staphylococcus aureus considered the most common cause of ocular infection was isolated in 5(4.5%) samples, while staphylococcus epidermidis considered apathogenic was isolated in 16 (14.5%) samples (table 6). In recent times however, many centres considered staphylococcus epidermidis a potential pathogen especially when it's increasing role in post operative endophthalmitis was considered.

Fungus is known to cause ocular inflammations[2,8,9,10] Out of 14 (12.6%) samples of fungi in this study, Fusarium spp was found in 3(2.7%) samples. Clinically one patient had hypopyon keratitis "resistant to therapy", and one had endophthalmitis.. The other Fusarium coexisted with verticilium spp. The patient had hypopion keratitis also. Other species of fungi isolated we believed, were due to environmental contamination and/or the frequent use of corticosteroid.

Many of the good and effective antibiotics and chemotherapeutic drugs are not prepared as eye drops. (table 6). The ineffective method of application and wrong dosage were responsible for the observed persistent infection. A recent study confirmed the fact that there is yet no good documented investigation to show that sensitivity test result done based on systemic antibiotics could be transferred to the conjunctiva, and since the serum titre of antimicrobes and their kinetics differ from that of the eye drops on the conjunctiva, a high concentration of the antibiotics (100–500 times the serum concentration) can be used, (depending on the circumstances) so that the concentration in the tearfilm at least temporarily could reach a therapeutic level[6]. We recommend therefore, that

(i) topical antibiotic therapy be used depending on

the sensitivity results. To reach therapeutic level on the conjunctiva, antibiotic drops should be given hourly, ointments 2 hourly.

(ii) to reach the infection reservoirs in the lash follicules, and the oil glands in the lids, antiseptics like PVP – iodine solutions of different concentrations be used to scrub/clean the lids.

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