Blepharitis: epidemiology, etiology, clinical presentations, treatment and evolution of our patients

Blefarite: epidemiologia, etiologia, apresentações clínicas, tratamento e evolução de nossos pacientes

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ABSTRACT

Objective: *Blepharitis is one of the most commonly encountered conditions in ophthalmic practice and is a frequent cause of eye irritation and discomfort. Being a difficult to treat disease, the authors sought to better understand the epidemiology, etiology, clinical presentations, treatment and evolution of their patients, aiming at greater therapeutic success.* ***Methods:*** *The medical records of 124 patients of Centro de Oftalmologia Tadeu Cvintal who had blepharitis were retrospectively and cross-sectionally evaluated and underwent severity classification and collection of eyelid secretions for bacterial culture and antibiogram.* ***Results:*** *The mean age of the patients was 67.4 years, females accounted for 70 (56.4%) cases and males for 54 (43.5%). Regarding the severity of the disease, there were 71 cases of mild blepharitis (56.8%), 52 (41.6%) with moderate intensity and 2 (1.6%) severe cases. Evaluating the follow-up of treatment of the disease, it was observed that 103 (82.4%) patients did not return to evaluate the treatment outcome and only 22 (17.6%) returned. In respect of the cultures performed, 82 (66.1%) did not show microbial growth. Among the 42 (33.8%) positive samples, coagulase-negative staphylococci were the most prevalent, especially Staphylococcus epidermidis, responsible for 35 (83.3%) of them. As for antibiotic sensitivity, the agents in our sample showed greater resistance to Penicillin, Erythromycin and Ciprofloxacin and 100% sensitivity to Linezolid, Vancomycin and Daptomycin.* ***Conclusion:*** *By better understanding the epidemiological characteristics of blepharitis and the antimicrobial sensitivity of the bacteria involved, it is possible to offer more effective treatments.*

Keywords: *Blepharitis/epidemiology; Blepharitis/etiology; Blepharitis/therapy; Inflammation; Microbial sensitivity tests; Culture techniques*

RESUMO

Objetivo: A blefarite é uma das condições mais comumente encontradas na prática oftalmológica e se constitui em uma causa frequente de irritação e desconforto ocular. Por ser uma doença de difícil tratamento, os autores buscaram compreender melhor a epidemiologia, etiologia, apresentações clínicas, tratamento e evolução de seus pacientes, visando maior sucesso terapêutico. **Métodos:** Foram avaliados retrospectivamente e transversalmente o prontuário de 124 pacientes do Centro de Oftalmologia Tadeu Cvintal, os quais apresentavam blefarite e foram submetidos à classificação de gravidade e coleta de secreções palpebrais para cultura bacteriana e antibiograma. **Resultados:** A media da idade dos pacientes foi de 67,4 anos, o sexo feminino foi responsável por 70 (56,4%) casos e o masculino por 54 (43,5%). Quanto à gravidade da doença, constatou-se 71 casos de blefarite leve (56,8%), 52 (41,6%) com intensidade moderada e 2 (1,6%) casos graves. Avaliando o seguimento do tratamento da doença, foi observado que 103 (82,4%) pacientes não retornaram para avaliar o resultado do tratamento e apenas 22 (17,6%) retornaram. Em relação às culturas realizadas, 82 (66,1%) não apresentaram crescimento microbiano. Dentre as 42 (33,8%) amostras positivas, os Staphylococcus coagulase negativo foram os mais prevalentes, sobretudo os Staphylococcus epidermidis, responsável por 35 (83,3%) delas. Quanto à sensibilidade aos antibióticos, os agentes de nossa amostra demonstraram maior resistência à Penicilina, Eritromicina e Ciprofloxacino e 100% de sensibilidade à Linezolida, Vancomicina e Daptomicina. **Conclusão:** Conhecendo melhor as características epidemiológicas da blefarite e a sensibilidade antimicrobiana das bactérias envolvidas, é possível oferecer tratamentos mais eficazes.

Descritores: Blefarite/epidemiologia; Blefarite/etiologia; Blefarite/terapia; Inflamação; Testes de sensibilidade microbiana; Técnicas de cultura

INTRODUCTION

Blepharitis defines the inflammation of the eyelid margin, and is one of the most commonly found conditions in ophthalmic practice being a frequent cause of ocular irritation and discomfort.[1] Blepharitis can be classified as anterior when the inflammatory process affects the base of the eyelashes, ciliary follicles and the palpebral skin, or posterior when there is dysfunction of the Meibomius glands located on the posterior eyelid margin. Anterior blepharitis is divided into staphylococcal and seborrheic. The first has hard crushes at the base of the eyelashes, and is the result of an abnormal cellular response to the cell wall components of Staphylococcus aureus (S.aureus) . The second is frequently associated with generalized seborrheic dermatitis, and has soft, greasy crusts that stick to the eyelashes.[2]

The prevalence of blepharitis may vary from 37.0% to 50.0% according to some reports in the literature, most often affecting females over 50 years of age.[3-7]

Among the main signs and symptoms found, we can highlight: mild photophobia, visual turbidity, burning, tearing, feeling of sand, hyperemia of the eyelid margins, and crust formation.[1]

Blepharitis has a multifactorial pathogenic mechanism, and its etiology is not clearly known. Evidence indicates a relation with infectious, allergic, systemic and environmental components.[8] Therefore, treatment regimens can often fail.

The aim of the present study was to identify the most prevalent epidemiological characteristics of our patients with blepharitis, the main etiological agents, clinical presentations, the best treatment, and the progression of the disease.

METHODS

This is a cross-sectional, retrospective study carried out with the review of medical records of patients treated between 08/01/16 and 08/01/17 with indication for cataract surgery. The study was previously submitted and approved by CEP do Instituto Suel Abujamra, SP, Brazil. The study was carried out at Centro de Oftalmologia Tadeu Cvintal, a philanthropic institution located in the city of São Paulo and accredited by the Ministry of Education and Culture (MEC) as an educational institution for medical residency in ophthalmology and which exclusively serves patients from the Brazilian Unified Health System.

As a case definition in the present study, the patients were considered as blepharitis patients when presenting eyelid hyperemia and crusts and/or dilation of the Meibomius glands at the moment of evaluation.

Blepharitis found was classified as mild (ciliary base hyperemia), moderate (crust in half of the ciliary base or Meibomius glands dilation), and severe (crusts in most cilia associated with hyperemia and intense eyelid edema).

Eyelid secretions for culture were collected using a specific swab for bacterioscopy and culture, with secretions from the lower and upper eyelid edges of only one eye of each patient being collected. When positive, cultures were subjected to antibiogram.

RESULTS

During the study period, 1000 medical records were reviewed. Of these, 124 patients had blepharitis and underwent severity classification and collection of eyelid secretions for culture.

The average age of the patients was 67.4 years (ranging from 18 to 91; SD 11.7 years). Females accounted for 70 (56.4%) cases, and males for 54 (43.5%). Regarding the severity of the disease, more than half had mild blepharitis in a total of 71 cases (56.8%), 52 (41.6%) cases were moderate, and 2 (1.6%) severe. Evaluation of the disease treatment follow-up showed that 103 (82.4%) patients did not return to evaluate the treatment outcome, and only 22 (17.6%) returned. Regarding the cultures carried out, 82 (66.1%) did not show microbial growth. Among the 42 (33.8%) positive samples, coagulase-negative Staphylococcus (CNS) was the most prevalent one, especially Staphylococcus epidermidis, accounting for 35 (83.3%) of them. Gram-negative microorganisms accounted for 3 cases (7.14%). Results for all cultures are shown in the following table:

Table 1
Culture results

Etiological agent	N	%
Negative culture	82	(66.1)
Enterococcus faecalis	1	(0.8)
Klebsiella pneumoniae	1	(0.8)
Staphylococcus epidermidis	35	(28.2)
Staphylococcus hominis	3	(2.4)
Staphylococcus lugdunensis	1	(0.8)
Streptococcus viridans	1	(0.8)
TOTAL	**124**	**(100)**

Looking for a relation between the intensity classification on physical examination and the presence of a positive culture, we found out that 23 of the 42 positive cultures were mild (54.76%) blepharitis, 18 were moderate (42.85%), and 1 was severe (2.38%). Comparing the percentages of mild, moderate and severe intensity of the total cases (with negative and positive cultures - 56.8%, 41.6% and 1.6%, respectively) to the percentages of intensity of positive culture cases (54.76%, 42.85% and 2.38%), we noted the tendency of the higher the intensity of the disease the greater the chance of contamination.

Based on the antibiograms of the cultures, table 2 shows the degree of sensitivity of the bacteria to the antibiotics tested. As we can see, it emphasizes how the bacteria studied show resistance to Penicillin, Erythromycin and Ciprofloxacin. However, Linezolid, Vancomycin and Daptomycin have been shown to be most effective against these bacteria.

DISCUSSION

One of the most recent reviews of blepharitis showed that females were the most prevalent among patients with blepharitis, as in our study, and it is unknown whether the female organism is more susceptible to blepharitis or whether women tend to seek medical services more than men. In our population, we found that the average age was greater than 50 years, also coinciding with the study data.[7]

According to the classification adopted in the present study for blepharitis severity, most were mild and moderate showing that the disease is not so commonly manifested so aggressively in our population, unlike an Australian study in which most cases of posterior blepharitis were severe. [9]

Tabela 2
Sensitivity profile of etiological agents

Antibiotic	Sensitive		Intermediate		Resistants		Total Tested
	n	(%)	n	(%)	n	(%)	
Ciprofloxacin	33	(78.5)	1	(2.4)	8	(19.4)	42
Clindamycin	35	(83.3)	2	(4.8)	5	(11.9)	42
Daptomycin	32	(100)	0	(0)	0	(0)	32
Erythromycin	22	(52.4)	1	(2.4)	19	(45.2)	42
Gentamicin	36	(85.7)	3	(7.1)	3	(7.1)	42
Linezolid	42	(100)	0	(0)	0	(0)	42
Penicilin	4	(9.5)	0	(0)	38	(90.5)	42
Rifampicin	40	(97. 6)	0	(0)	1	(2.4)	41
Sulfa/Trimetropim	39	(95.1)	0	(0)	2	(4.9)	41
Teicoplanin	40	(97.6)	1	(2.4)	0	(0)	41
Vancomycin	42	(100)	0	(0)	0	(0)	42

Evaluation of our patients' follow-up showed that 82.4% of patients did not return to evaluate the treatment outcome, with only 17.6% returning. We believe that this data is due to the patients' common behavior in devaluing the follow-up of blepharitis treatment after the end of symptoms. They only look for treatment when they are in the symptomatic period. Better guidance to patients could reduce this number and favor better follow-up and treatment of the disease, reducing early relapses.

The results of bacterial cultures demonstrated the high prevalence of CNS, which converges with data found by a recent systematic review.[10]

In a Brazilian study from the 1980s, a positive culture for S. aureus was found in most patients.[11] This differs from our data, possibly suggesting a change in bacterial flora over time not only in Brazil but also worldwide, as the study suggests.[10]

A study evaluating the normal bacterial microbiota of the eyelids [12] showed that CNS is the most common bacteria (58.33%), followed by Streptococcus spp (2.5%), Corynebacterium (1.67 %), Micrococcus spp (1.67%) and S. aureus (0.83%). We can see that the bacterial flora of our blepharitis sample is similar to that of healthy eyelids.

A recent study in Ethiopia evaluated the bacterial culture of 21 blepharitis patients, among which we highlight the 3 most prevalent bacteria: 7 (33.33%) S. aureus, 6 (28.57%) CNS, and 3 (14.28%) H. Influenzae.[13] These findings are very different from ours where CNS accounted for the vast majority of cases, showing the difference in flora among populations of different regions. This study also evaluated the sensitivity of the CNS, and only 3 antibiotics tested on it were tested in our study. The study showed that 22.2% of CNS were resistant to Ciprofloxacin, 13.9% to Erythromycin, and 33.3% to Penicillin. In our study, 11% of CNS showed resistance to Ciprofloxacin, 43% to erythromycin (with an additional 3% showing intermediate resistance to erythromycin), and 91% to penicillin. Thus, we observed how Ciprofloxacin acts better in our patients, and how Erythromycin and Penicillin act dramatically worse in our country compared to the Ethiopian Northwest, demonstrating that each population has a unique microbiota with antimicrobial sensitivity.

Among the topical antibiotics used to treat blepharitis, bacitracin, quinolones and macrolides which have anti-inflammatory action as well as antibacterial activity are frequent prescription choices. However, erythromycin, one of the class prototypes which is widely used in the medical field, has developed bacterial resistance according to a recent review article,[14] data compatible with our research which was the second most resistant option. When considering treatment with systemic antibiotics for blepharitis, we emphasize the use of oral tetracycline which also treats rosacea due to its effect of inhibiting bacterial lipase production and reducing fatty acids, which is an interesting advantage since rosacea worsens blepharitis.[8] However, its indication is limited due to prolonged use and emergence of side effects. Alternatively, there is the more tolerable Doxycycline (Tetracycline analog),[15] and Azithromycin, which has the benefits of its class (macrolides), reduced treatment time, [16] fewer side effects, and faster improvement of the condition than Doxycycline. [15] Unfortunately, Doxycycline and Azithromycin were not evaluated in antibiograms in our sample, and we do not know if for our population they would be good choices. The best options for our patients would be: Daptomycin, Linezolid, and Vancomycin (all with 100% sensitivity).

Infectious anterior blepharitis can also be caused by viruses or parasites.[17] It is important to mention that our study found no viral or parasitic blepharitis.

In general, the cause of blepharitis is unknown, multifactorial, and with probable bacterial implication. In its pathogenesis, bacterial lipase alters the secretion of the Meibomius gland, increasing cholesterol concentration and favoring bacterial growth and proliferation. In addition, bacterial toxic waste, tissue invasion, and immune response are important for the development of the disease.[1] However, not all cases are related to infection. In the population investigated, our study showed that 66.4% of patients had no blepharitis associated with bacterial colonization, which questions the extent to which bacterial participation is directly involved in the pathogenesis of the disease. It is common to find blepharitis associated with systemic conditions such as rosacea and seborrheic dermatitis,[1] but these underlying pathologies were not studied in our sample, which may be responsible for the pathogenesis of non-colonized patients.

CONCLUSION

Conhecendo as características epidemiológicas da Blefarite, pode Knowing the epidemiological characteristics of blepharitis, we can better direct our diagnostic hypotheses. Based on the characteristic of the physical examination, we were able to estimate the etiology of the disease as to whether it is more likely to be caused by infection or not, and thus to better direct our treatment. It is extremely important to know the most prevalent

bacteria in the population treated by each service and their respective sensitivities to antibiotics, aiming at a more effective personalized treatment.

The present study allowed us to better understand the main agents involved in blepharitis cases in our service, and what are the best antibiotics to use. It also strengthens the real importance that every health professional shall give to bacterial resistance to antibiotics, making conscious and accurate use of these drugs.

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