

BLEPHARITIS (*)

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In the evolution of our understanding of diseases the initial descriptive period is followed by a search to find the cause as knowledge of this enables the clinician potentially to interfere. Therefore, an etiological classification is more desirable than a descriptive one.

It was generally accepted that in blepharitis the clinical classification of the two main forms paralleled the etiological classification as the ulcerative form was held to be the result of staphylococcal infection, while squamous blepharitis was believed to be associated with constitutional factors.

Thygeson (1946, 1954) isolated, however, in a large proportion of squamous blepharitis staphylococci from the lid-margin. Galin (1962) confirmed this finding and felt that the classification into squamous and ulcerative blepharitis is not rigidly supported by bacteriological studies. As a result of his therapeutic trials one can doubt the primary pathogenic role of the staphylococci.

Staphylococci are commensals and these organisms can be expected to be found even on the normal lid-margin in a number of cases but hardly with the frequency with which they are reported isolated in squamous blepharitis. Yet, in spite of these findings that seem to be at variance with the classical concept, many clinicians do feel that both forms differ in their pathogenesis.

We have tried to resolve the problem by redefining squamous and ulcerative blepharitis on the basis of their epidemiological characteristics and by reevaluating the bacteriological situation. From our observations we may conclude that also epidemiologically the ulcerative and squamous type differ distinctly.

MATERIAL AND METHODS

In this study an effort was made to include only those cases that could be classified clinically as to belong to the squamous or the ulcerative type of blepharitis. In only a small number of cases there was considerable doubt in retrospect as to their proper classification. A total of 746 patients, 395 males and 351 females were reviewed over a 10-year period.

All cases were classified according to year and month in which the patients sought first attention and the age and sex of the patients. Data were analysed with variance analysis. In 478 cases of squamous blepharitis and 109 cases of ulcerative ble-

pharitis the refractive error was studied. For isolated or combined astigmatic errors, the spherical equivalent was used. In 331 patients with squamous blepharitis and 105 patients with ulcerative blepharitis qualitative and semi-quantitative bacteriological studies on blood-agar, Mc. Conkey and T.T.N. media (van Bijsterveld and Winkler 1970) were carried out, as well as cytological studies.

All patients in which coagulase positive staphylococci were isolated were treated with local antibiotherapy in the majority of cases based on sensitivity studies of the organisms isolated. In the last years prior to local therapy the lid-margins were defatted. In patients with skin changes, secondary to the infection of the lid-margin, steroids were generally used as treatment. The duration of treatment depended on the severity of the disease. In the course of events many combinations of treatments were tried.

RESULTS

Incidence — A total of 746 cases were studied during the 10-year period. This represents an all over percentage of 0.4 of all out-patient department consultations. Of these, 586 patients (0.31%) were diagnosed as having squamous blepharitis and 160 patients (0.09%) as having ulcerative blepharitis. Of the two main forms, therefore, squamous blepharitis represents 78.6% and ulcerative blepharitis 21.4% of all blepharitis cases.

Distribution per years and per month — The distribution of the average number of squamous blepharitis cases for each year in the 10-year period is shown in Figure 1. In this period there appeared to be a significant difference in the number of cases per year. Peaks were found in 1967, 1971 and 1972 while those in 1963, 1964 and 1970 were well below the average. Although there were considerable fluctuations in the number of cases in each month in the observed period, the average number of cases in each month over the 10-year period did not differ significantly. In Table I these average numbers expressed in percentages are shown.

For ulcerative blepharitis a significant difference in the number of cases per year over the 10-year period was also observed (Figure 1), but the fluctuations from year to year were not as pronounced as in the squamous form. In the average number of cases for each month in the observed period no difference was found (Table 1).

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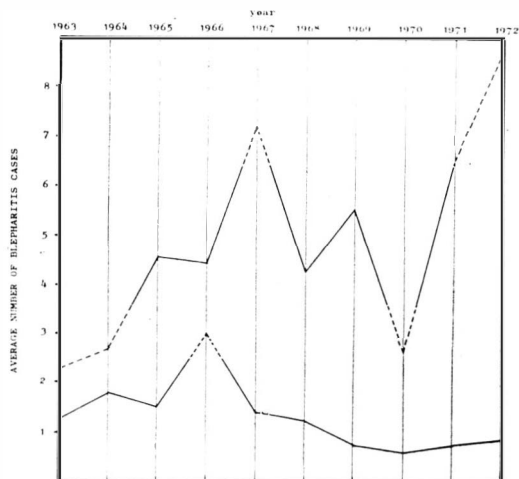


Fig. 1 — (van Bijsterveld, Binkhorst and Volpini). Frequency diagram of the average number of squamous blepharitis cases (upper line) and ulcerative blepharitis (lower line) over a 10-year period. The broken lines are outside the 99 percent confidence intervals.

Table 1 — Percent blepharitis cases per month averaged over 10 years.

month	J	F	M	A	M	J	J	A	S	O	N	D
blepharitis												
squamous	9.4	8.8	9.7	7.0	8.9	7.3	9.0	10.1	8.2	6.7	9.0	7.8
ulcerative	6.3	5.6	10.0	7.5	8.8	10.0	8.1	10.6	7.5	10.0	6.9	8.8

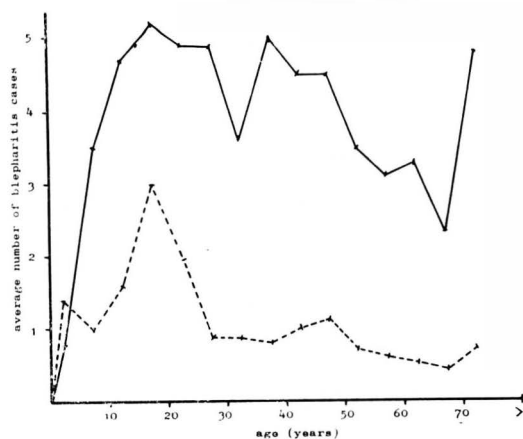


Fig. 2 — (van Bijsterveld, Binkhorst and Volpini). Frequency polygon of the average number of squamous (solid line) and ulcerative (broken line) blepharitis cases in the stated age classes.

In the group of ulcerative blepharitis there was an entirely different situation. Here we found that there was a significant difference between the number of male and female patients. In Table 2 the number of male and female patients over the 10-year period is given in percentages.

Age — In Figure 2 the average number of squamous blepharitis cases are shown in age class intervals of 5 years. There is a rapid rise until a peak is reached in the age category of 15 to 20 years, then there is a gradual decline until the age category of 65 to 70 years. Thereafter there is a rather sudden rise in cases, mostly seen in women. These cases were clinically classified as the squamous form but there was considerable doubt about any association with seborrhoea. The broken line in Figure 2 represents the average number of cases of ulcerative blepharitis. Here it should be noted that the pattern of distribution in the various age categories is quite different from that seen in squamous blepharitis. After a peak in the 15 to 20 year age category the number of cases dropped rather precipitously and remained close to the general average.

Sex — In 586 cases of squamous blepharitis 301 were male and 285 were female patients. All over, this does not represent a significant difference (Table 2).

Table 2 — Percent male and female patients with squamous and ulcerative blepharitis over the 10-year period.

blepharitis	squamous		ulcerative	
	men	women	men	women
year				
1963	1.9	2.7	7.5	1.9
1964	2.9	2.4	10.0	3.8
1965	5.3	4.3	8.8	2.5
1966	5.5	3.6	13.8	9.4
1967	7.2	7.8	5.0	5.6
1968	2.7	5.8	4.4	5.6
1969	6.8	4.6	3.1	2.5
1970	3.2	1.9	1.3	3.1
1971	6.0	7.3	3.1	2.5
1972	9.9	8.2	1.9	4.4

Refraction — In squamous blepharitis we found a significant shift towards hyperopia. This was caused by a relative large number of patients with a mild hyperopia of 0.50 to 2.50 diopters. In ulcerative blepharitis no significant difference in the distribution of hyperopic and myopic refraction errors was found. Therefore, an association between blepharitis and hyperopia was only found for the squamous type. In Table 3 the percentages of refraction anomalies in patients with blepharitis of both types ranging from hyperopia of 5.50 diopters or more to myopia of 5.50 or more in class intervals of 1 diopter are shown.

Table 3 — Percent blepharitis cases with refraction anomalies in the stated classes.

refraction	+4.50		+2.50		+0.50	-0.50	-2.50		-4.50		
blepharitis											
squamous	1.5	2.3	5.0	11.3	20.9	35.6	9.8	4.0	5.2	1.3	3.1
ulcerative	2.8	2.8	1.8	7.3	11.9	53.2	12.8	3.7	0	0.9	2.8

Bacteriology — In all but 2 cases of 105 cases of ulcerative blepharitis, coagulase positive *Staphylococcus aureus* were isolated. In those two cases which were more of a macerating than an ulcerative type, *Moraxella nonliquefaciens* and *Pseudomonas aeruginosa* were isolated. From 331 cultures of the lid-margin in squamous blepharitis in 152 times (45.9%) staphylococci were isolated.

Therapeutic response — The prognosis on the basis of treatment outlined earlier differed considerably between the two main groups. In the ulcerative blepharitis group a definite cure was obtained after the staphylococci were eliminated and the reactive secondary skin changes subsided. The duration of the treatment was dependant upon the secondary skin changes. In the group of the squamous blepharitis we had the impression of a very small but definite improvement after staphylococci, — if present —, were eliminated but control of the blepharitis necessitated a sustained therapeutic effort and a definite cure could not be obtained.

COMMENT

Blepharitis is generally considered a common condition. We found the incidence, however, to be rather low. Probably because blepharitis attracts attention and because of its chronicity it gives the impression of a common disease. Selection of patients at university hospitals may also have a certain effect on the incidence.

A striking difference was found between both blepharitis types with regard to the distribution over the various age classes. In squamous blepharitis, the rapid rise and gradual decline follows the pattern seen in seborrhoea. In the ulcerative type there is also a peak in the 15 to 20 year age class, but thereafter the number of cases drops rather precipitously.

In squamous blepharitis there was no significant difference in the number of male and female patients, but in ulcerative blepharitis men are affected 42% more than women. This preponderance in men is difficult to explain.

There seems some controversy as to the association of hyperopia and blepharitis

(Thygeson 1946, Rotter 1950). We found that in respect to the refractive status squamous and ulcerative blepharitis differed also. In the squamous type, there was a very significant association with hyperopia, but not in the ulcerative type. Failure in the past to find this association with hyperopia may have been the result of not separately analysing both types of blepharitis. This association of hyperopia and squamous blepharitis, we feel has nothing to do with a causal relationship.

In practically all cases of ulcerative blepharitis we isolated *Staph aureus*. In two somewhat atypical cases with macerating rather than ulcerating blepharitis other organisms were found to be responsible. In addition to staphylococci other organisms can be isolated occasionally from typical ulcerative blepharitis but usually in small number. In squamous blepharitis conditional pathogens of the Enterobacteriaceae and Micrococcaceae families were sometimes isolated but as a rule in small numbers and we do not think these organisms to be of importance in the pathogenesis of blepharitis.

There was a marked difference between squamous and ulcerative blepharitis in the response to treatment. It must be emphasized that various therapeutic regimens were used during the observation period, but still some general conclusions could be drawn from the results. In uncomplicated ulcerative blepharitis local antibiotherapy obtained a definite cure. If secondary skin changes were present a definite cure could be obtained if these skin changes could be normalized which was done with steroids or keratolytic agents in addition to the elimination of the staphylococci. In squamous blepharitis the situation is different. Although we have the impression that antibiotherapy, if staphylococci were present, improved the situation slightly, a definite cure could not be obtained. The exact role of the staphylococci remained puzzling in this form. Mixed forms must be viewed basically as squamous types in which staphylococci display invasive tendencies. Failures of complete cures in what appeared to be ulcerative blepharitis are often cases of the mixed type, in which the ulcerative process dominated the clinical picture. After eliminating the staphylococci, there still remains the squamous component which is so difficult to control.

SUMMARY

Blepharitis has a low incidence. In our material we found this to be 0.4% of all out-patient-department consultations. The ratio of squamous to ulcerative blepharitis is almost 4 to 1. There is no preponderance in any type to prevail in any season. Squamous and ulcerative blepharitis differ in their age distribution. While there is no difference in the number of male and female patients in squamous blepharitis, there were significantly more male patients with ulcerative blepharitis. In our material squamous blepharitis was associated with a higher proportion of hyperopes, but in ulcerative blepharitis the proportion of hyperopic and myopic patients was not significantly different.

In 98.1% of ulcerative blepharitis *Staph. aureus* was isolated and elimination of these staphylococci resulted in a cure provided no permanent anatomical damages as a consequence of previous infections were present. In squamous blepharitis, elimination of staphylococci improved the situation only slightly.

We found on the basis of our epidemiological studies squamous blepharitis and ulcerative ble-

pharitis to be distinctly different clinical entities. We feel that ulcerative blepharitis is caused directly by staphylococci.

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