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The Bacteriological study of chronic dacryocystitis

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Abstract:
Purpose: *To find out the bacteria involved in chronic dacryocystitis and their sensitivity to different antibiotics.*
Materials and methods: *Study conducted on 200 patients. Inclusion criteria for the study are 1)Watering/mucopurulent discharge from eyes for more than 3 months.2)Preoperative evalution for cataract surgery revealing chronic dacryocystitis, excluding patients with block of nasolacrimal duct due to tumors and drugs. Discharge from puncta was collected with a moistened sterile swab without touching the lid margin or adjacent skin. In cases, without discharge, specimen was collected from the fluid regurgitating from puncta on lacrimal syringing. Material was sent for Gram's staining and culture plating on blood agar, Mc Conkey's agar. Examination of the plates was done after 18-24 hours. If no growth is seen, plates are further incubated for 48 hours. Sensitivity to antibiotics was tested by Kirky Bauer method or Muller-Hinton agar method.*
Results: *Out of 200 patients, 115 showed a positive bacterial growth, of which 74% were gram-positive and 34% were gram-negative organisms, 85 did not show any growth. Staphylococcus aureus 37, Klebsiella 17, Pneumococci 13, mixed cultures7, Staphylococcus epidermidis 10, alpha hemolytic streptococci 5, B. catarrhalis 5 and anaerobes 3.*
*The antibiotic sensitivity patterns are as below , Staphylococcus aureus sensitive to Ciprofloxacin, Klebsiella sensitive to Gentamicin, Ciprofloxacin, Norfloxacin and Cotrimoxazole, Pneumococci sensitive to Amoxycillin, Penicillin, E.coli sensitive to Gentamicin, Ciprofloxacin and Norfloxacin and B. catarrhalis sensitive to Amoxycillin, Penicillin, Ciprofloxacin, Norfloxacin and Doxycycline***.**
Conclusions*: The present study revealed that most commonly encountered organism was Staphylococcus aureus which is most sensitive to Ciprofloxacin.*
Key Words: *Chronic dacryocystitis, Bacteriological study, Lacrimal apparatus, Gram's* stain, culture plating on blood agar, Mc Conkey's agar, Kirky Bauer method and Muller Hinton method.

I. Introduction:

Dacryocystitis - inflammation of the lacrimal sac and duct - is a common and unpleasant disease, partly because of the troublesome and conspicuous tearing it may cause, partly because it has little tendency to resolve and its adequate treatment presents considerable problems.

The peculiar location of the lacrimal sac i.e., at the junction of the orbit and nose makes it to be frequently involved by diseases of both these sites and in turn it can lead to complications in either of the adjoining structures.

Dacryocystitis is a problem not only to the patients but also to the ophthalmologist. It not only causes social embarrassment by constant watering and discharge but also a menace to the integrity of the eye. It is usually caused due to an obstruction to flow of tears in the bony passages, that leads to stasis in the sac, which gets infected. Organisms from both ends of the passage can infect the sac and also infection in paranasal sinuses, oral cavity and anywhere else in the body can spread to the sac. Hence a detailed examination to rule out any infected foci is a must.

Dacryocystitis in turn can spread to involve other adjoining structures due to continuity and by haematogenous route to involve distant sites. It causes chronic conjunctivitis, bacterial persistent ulcers, panophthalmitis with loss of the eyeball, facial cellulitis, orbital cellulitis and even cavernous sinus thrombosis can occur, putting the patient's life in danger. Dacryocystitis could be, congenital, acquired or traumatic.

Untreated dacryocystitis never undergoes spontaneous resolution. Any decisions as to the lines of treatment should be preceded by a complete investigation of the lacrimal passages without which cases will inevitably occur wherein the wrong treatment is adopted.

In view of the above facts, this bacteriological study was undertaken keeping in mind the following aims:
1. To find out the bacteria involved in chronic dacryocystitis and their sensitivity to different antibiotics.
2. To estimate the frequency of commonly occurring organisms in this part of the country.
3. To compare incidence of chronic dacryocystitis in both the sexes.

In this way the best line of treatment can be decided for the patient.

II. Materials And Methods :

A prospective study was undertaken to find out the bacteria involved in chronic dacryocystitis and their sensitivity to different antibiotics.

It included 200 patients attending the OPD at Vydehi Institute of Medical Sciences and Research Center. The study was conducted from June 2005 to June 2007. the patients who satisfied the following criteria were included in the study.

- Watering or mucopurulent discharge from the eyes for more than 3 months
- Preoperative investigations for cataract surgery revealing chronic dacryocystitis.

Patients with block of nasolacrimal duct due to tumors and drugs were excluded.

A detailed history including age, socioeconomic status, type of complaint and duration of complaints, treatment take elsewhere was noted followed by temperature, blood pressure, pulse recording and systemic examination.

A thorough ocular examination to look for regurgitation from the puncta on pressure over these area, swelling, any other abnormalities and lacrimal syringing was carried out, followed by examination of the nose. Purulent material from the puncta was collected with a moistened sterile swab without touching the lid margin or adjacent skin. In cases, without discharge, the specimen was collected from the fluid regurgitating from the puncta on lacrimal syringing.

The material was sent for Gram's staining and culture plating on blood agar and Mc Conkey's agar. Examination of the plates was done after 18-24 hours. If no growth is seen, the plates are further incubated for 48 hours.

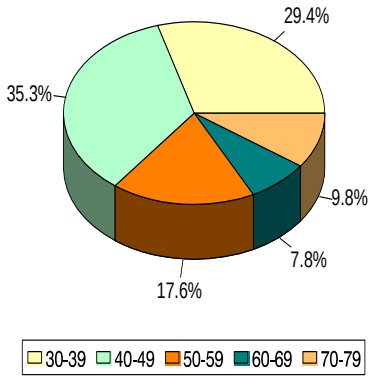
Scrapings from corneal ulcers were taken from the edges and the base with a moistened sterile swab and directly plated. Sensitivity to antibiotics like Ciprofloxacin, Norfloxacin, Gentamycin, amoxycillin, penicillin, Doxycycline and Cotrimoxazole was tested by the disc diffusion technique or Kirky Bauer method or Muller-Hinton agar.

In all patient investigations like urine sugar Hb%, TC, BT and CT were carried out.

III. Results

Table 1
Age Incidence

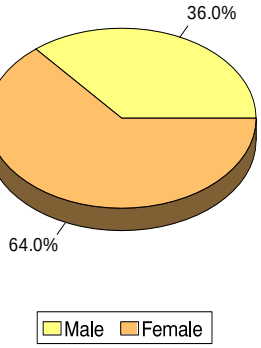
Age Group in years	No. of patients	Percentage
30-39	59	30
40-49	71	36
50-59	35	18
60-69	16	8
70-79	19	10



The maximum number of cases was seen in the age group of 40-49 yrs followed by 30-39 years and 50-59 year.

Table 2
Sex Incidence

Group	No. of patients	Percentage
Male	72	36%
Female	128	64%

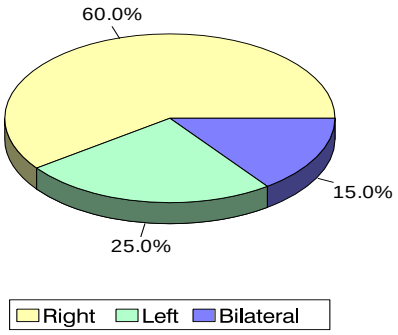


The incidence in females (64%) was much higher than in males (36%)

Table 3
Laterality

Side	No. of patients	Percentage
Right	120	60
Left	50	25
Bilateral	30	15

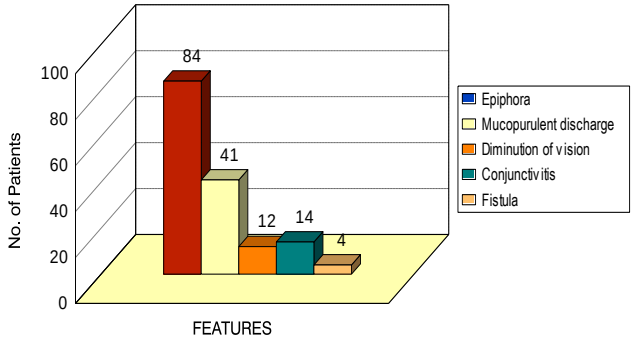
Table 3 Laterality Side No. of patients Percentage **Right 120 60 Left 50 25 Bilateral 30 15**



The percentage of patients with involvement of the right side (6.0%) was much higher, followed by involvement of the left side (25%) and bilateral involvement (15%).

Table 4
Presenting features

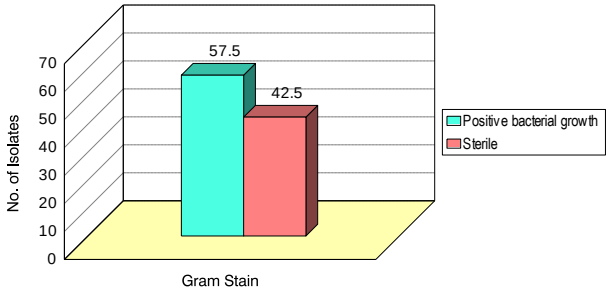
	No. of patients	Percentage
Epiphora	168	84
Mucopurulent discharge	82	41
Diminution of vision	24	12
Conjunctivitis	28	14
Fistula	8	4



84% of the patients presented with epiphora 41% of the patients had mucopurulent discharge followed by conjunctivitis (14%) diminution of vision (12%) and fistula (4%)

Table 5
Bacteriological features

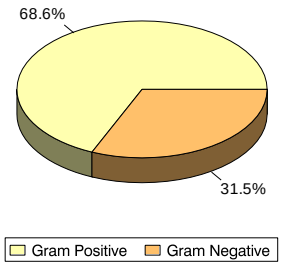
	No. of patients	Percentage
Positive bacterial growth	115	57.5
Sterile	85	42.5



57.5% of the patients showed a positive bacterial growth while 42.5% of patients had no growth

Table 6
Gram Staining Pattern

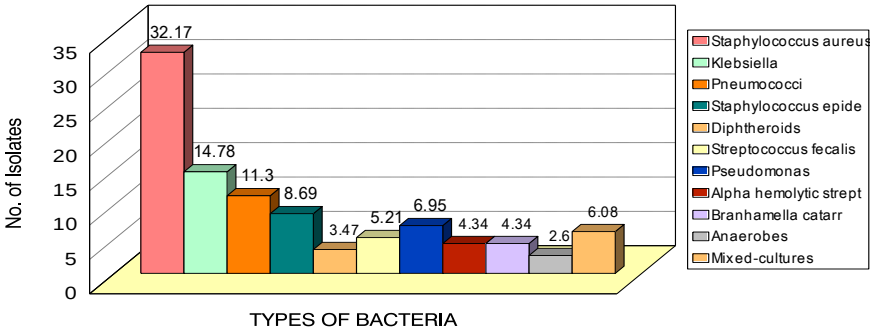
Gram Stain	No. of Isolates	Percentage
Gram-positive	85	68.55%
Gram-negative	39	31.45%



68.55% (84/124) of the isolates were gram-positive and 31.45% (39/124) were gram-negative

Table 7
Bacterial pattern

Type of bacteria	No. of isolates	Percentage
Staphylococcus aureus	37	32.17
Klebsiella	17	14.78
Pneumococci	13	11.30
Staphylococcus epidermidis	10	8.69
Diphtheroids	4	3.47
Streptococcus fecalis	6	5.21
Pseudomonas	8	6.95
Alpha hemolytic streptococci	5	4.34
Branhamella catarrhalis	5	4.34
Anaerobes	3	2.6
Mixed-cultures	7	6.08



Out of the 115 isolates Staphylococcus aureus was isolated in 32.17% (37/115) of patients, Klebsiella in 14.78% (17/115), Pneumococci in 11.30% (13/115), Staph epidermidis in 8.69% (10/115), Diphtheroids in 3.47% (4/115), Strep fecalis in 5.21% (4/115), Pseudomonas in 6.95% (8/115), Alpha hemolytic streptococci in 4.34% (5/115), Branhamella catarrhalis in 4.34% (5/115), Anaerobes in 2.6% (3/115) and mixed cultures in 6.08% (7/115). Anaerobes were identified indirectly by their Gram-positively and sterile cultures on aerobic media. Mixed cultures included E. Coli and Klebsiella in 2 patients and Staph aureus and Klebsiella in 5 patients.

Table 8
Antibiogram (Sensitivity Percentage)

Antibiotic	No. of isolates sensitive to	Sensitivity percentage
Amoxycillin	54	46.95
Penicillin	38	33.04
Gentamicin	77	66.95
Ciprofloxacin	99	86.08
Norfloxacin	73	63.47
Cotrimoxazole	54	46.95
Doxycycline	38	33.04

The present study showed 46.95% (54/115) sensitivity to Amoxycillin, 33.04(38/115) sensitivity to Penicillin, 66.95% (77/115) sensitivity to Gentamicin 86.08% (99/115) sensitivity to Ciprofloxacin, 63.47% (73/115) sensitivity to Norfloxacin, 46.95% (54/115) sensitivity to Cotrimoxazole and 33.04% (38/115) sensitivity to Doxycycline.

Table 9
Sensitivity pattern of the isolates

Organisms	Amoxycillin	Penicillin	Gentamycin	Ciprofloxacin	Norfloxacin	Cotrimoxazole	Doxycycline
Staph aureus	36.36	18.18	63.63	72.72	45.45	-	18.18
Klebsiella	57.14	-	100	100	100	100	57.14
Pneumococci	100	100	-	100	-	100	33.33
Staph epidermidis	100	100	100	100	100	-	-
Alpha hemolytic strep	100	100	-	100	-	100	100
Pseudomonas	-	-	100	100	100	100	100
Strep fecalis	-	-	100	-	-	-	-
E.coli	-	-	100	100	100	100	-

According to this table staph aureus was most (72.72%) sensitive to Ciprofloxacin, Klebsiella was 100% sensitive to Gentamicin, ciprofloxacin, Norfloxacin and Cotrimoxazole, Pneumococci was 100% sensitive to Amoxycillin, Penicillin, Ciprofloxacin and Cotrimoxazole, Staph epidemidis was 100% sensitive to Amoxycillin, Penicillin, Ciprofloxacin and Norfloxacin, Alpha hemolytic strep was 100% sensitive to Amoxycillin, Penicillin, Ciprofloxacin, Cotrimoxazole and Doxycycline, Strep fecalis was 100% sensitive to Gentamicin and Cotrimoxazole, E.coli was 100% sensitive to Gentamicin, Ciprofloxacin, Norfloxacin and Cotrimoxazole, Diphtheroids were 100% sensitive to Ciprofloxacin and Norfloxacin and B. catarrhalis was 100% sensitive to Amoxycillin, Penicillin, Ciprofloxacin, Norfloxacin and Doxycycline

Fig. 1: Tube Coagulase Test - Positive and Negative:

Fig. 2: C-streak inoculation of blood agar showing Staphylococcal colonies

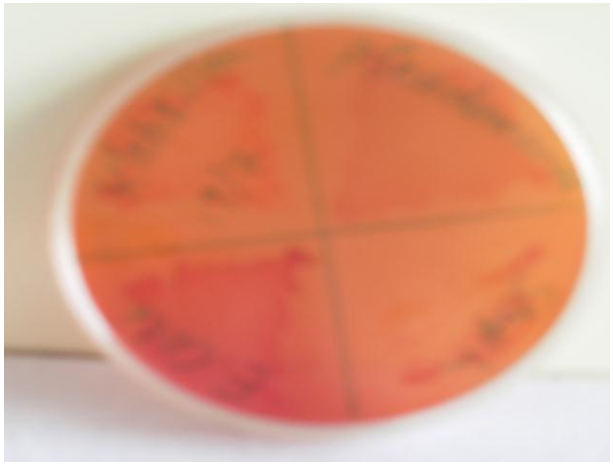


Fig. 3: Culture plate

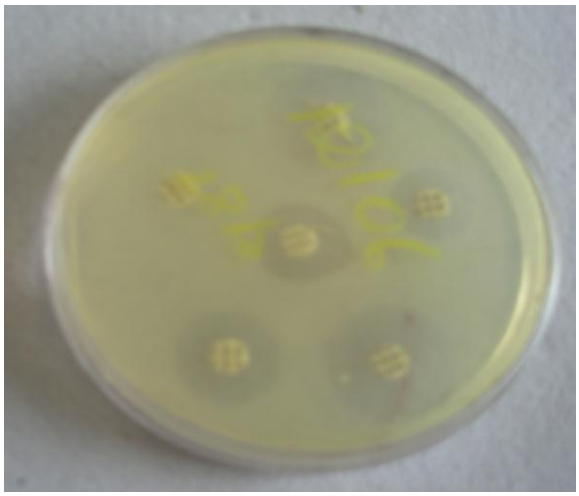


Fig. 4 : Antibiotic sensitivity testing on Muller Hinton Agar

IV. Discussion :

This prospective study of 200 patients was done to determine the type of bacteria involved in patients with chronic dacryocystitis.

In the present study the most common organism isolated was Staph aureus 32% followed by Klebsiella 14% and Pneumococci 11%. Among the mixed cultures also Klebsiella and Staph aureus predominated. Mixed cultures were seen in 6% of cases (2 patient was positive for E.coli and Klebsiella and 5 patients were positive for Staph aureus and Klebsiella).

The present study showed 46.95% (54/115) sensitivity to Amoxycillin, 33.04% (38/115) sensitivity to Penicillin, 66.95% (77/115) sensitivity to Gentamicin, 86.08% (99/115) sensitivity to Ciprofloxacin, 63.47% (73/115) sensitivity to Norfloxacin, 46.95% (54/115) sensitivity to Cotrimoxazole and 33.04% (38/115) sensitivity to Doxycycline.

This study showed that staph aureus was most (72.72%) sensitive to Ciprofloxacin, Klebsiella was 100% sensitive to Gentamicin, Ciprofloxacin, Norfloxacin and Cotrimoxazole, Pneumococci was 100% sensitive to Amoxycillin, Penicillin, Ciprofloxacin and Cotrimoxazole, Staph epidemidis was 100% sensitive to Amoxycillin, Penicillin, Ciprofloxacin and Norfloxacin, Alpha hemolytic strep was 100% sensitive to Amoxycillin, Penicillin, Ciprofloxacin, Cotrimoxazole and Doxycycline, Strep fecalis was 100% sensitive to Gentamicin and Cotrimoxazole, E.coli was 100% sensitive to Gentamicin, Ciprofloxacin, Norfloxacin and Cotrimoxazole, Diphtheroids were 100% sensitive to Ciprofloxacin and Norfloxacin and B. Catarrhalis was 100% sensitive to Amoxycillin, Penicillin, Ciprofloxacin, Norfloxacin and Doxycycline.

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