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Clinical and bacterological profile of chronic dacryocystitis in tertiary care centre in Tripura

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Abstract:
Background*: The aim of the present study is to evaluate the mode of presentation of dacrocystitis along with bacteriological profile of study subjects with dacryocystitis.*
Methods: *An Open Level Randomized Clinical Trial study was conducted from july 2015 to Jan 2017 with 100 diagnosed cases of chronic dacryocystitis were enrolled for the study. All patients were examined and samples were taken from lacrimal regurgitates. Samples were examined for Gram stain and culture and sensitivity.*
Results: *A sum total of 100 patients were included in the study among them most of them were females (52%) compared to males (48%). Among all the examined samples 20 % showed growth, rest 80 % samples did not show any growth. Among all positive growth, Staphylococcus aureus encountered as the commonest isolate (60%) followed by Staphylococcus epidermis (25%). All the gram positive organisms found to be sensitive towards vancomycin and fluroquinolones.*
Conclusion: *Both Gram positive and Gram negative organism are associated with with chronic dacryocystitis. Knowledge of the bacteriology of dacryocystitis and the susceptibility of the bacteria towards antibiotics will better guide a clinician in the choice of the medication for the most appropriate drug for the treatment.*
Keywords: *Chronic Dacrocystitis, Nasolacrimal duct obstruction, Epiphora.*

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I. Introduction:

Inflammation of the lacrimal sac is known as dacryocystitis. It mainly affects,infantsand adult females. Acquired dacryocystitis may be acute, sub acute or chronic. Approximately 60% of these patients gives h/o recurrence.[1]Chronic dacryocystitis is commonly caused by the stricture of the nasal duct arising from chronic inflammation, usually of nasal origin. A common organism involved is Staphylococcus aureus.[2] Chronic dacryocystitis is characterized by persistent epiphora and regurgitation of mucoid or mucopurulent material on pressure over the sac area. Few of the cases, the sac becomes distended and appears as a cystic swelling below the medial palpebral ligament; this is called mucocele.[3]

Chronic dacryocystitis is not only more common than acute dacryocystitis but also has several stages of presentation like epiphora, mucoid discharge, conjunctival hyperemia and chronic conjunctivitis.[4] This different presentation may be because of geographical variation in the microbiology of acute and chronic dacryocystitis and also different nasal pathologies which seem to play a crucial role in developing dacryocystitis.[5,6]

There has been growing noise about changing trendsin the microbiologic spectrum of dacryocystitis Initial studies have shown Gram positive isolates predominantly, some recent studies suggested an increasing frequency in gram negative organisms.[7]

Knowledge of the presence of nasolacrimal obstructionand the potential organisms inoculated is therefore of paramount importance before planning any intraocular procedure because of the potential risk of endophthalmitis especially in a country like India where we still need to fill a huge lacunae in the number of cataract surgeries.

II. Materials And Method

This study was an Open Level Randomized Clinical Trial study done with patients with diagnosis of Nasolacrimal Duct obstruction presenting at Out Patient Department of Department of Ophthalmology, AgartalaGovernment Medical College, Agartala for a period of One and half years, from July 2015 to Jan 2017.The study was approved by the Institutional ethical committee and it followed the tenects of the declaration of Helsinki. Informed consent was taken from all the patient before enrolling them into study.All symptomatic cases of epiphora which were diagnosed as NLD obstruction and who had given consent were

included in the study. Detailed history taking and ocular , adnexal examination was done according to a preset proforma. Nasolacrimal duct obstruction was diagnosed by regurgitation of fluid into the conjunctival sac by applying pressure over the lacrimal sac area. Lacrimal patency was checked by lacrimal syringing.

Specimens for microbiological analysis were obtained by wiping a broth-moistened swab across the lower conjunctival cul-de-sac and also from evertedpunta by applying pressure over the lacrimal sac area. The samples were collected with sterile cotton wool swabs, ensuring that the lid margins or the conjunctiva were not touched

One swab was used for Gram's staining and the second one for inoculation into culture media like BHI broth, Blood Agar and Chocolate Agar plates. The inoculated BHI broth and Blood Agar were incubated at 37 C for 24 to 48 hours. Chocolate Agar plateswereincubated at 37° C for 24 to 48 hours in the presence of 5 – 10% carbon-dioxide. After 24 hours of incubation, the plates were taken out from incubator and the colonies were examined for isolation and identification of organisms.

In the cases with mixed growth, the Gram stain was done separately from the morphologically different coloniesand the colonial characteristics were studied. The different colonies from which Gram staining was done and were further sub-cultured according to the Gram staining nature and characteristics. If the colonies were smooth, round and white/cream in colour and Gram positive cocci in clusters then it was inoculated on Mannitol Salt Agar. If the colonies were rough, Gram positive and in short or long chains and haemolysis was produced, it was sub-cultured on Blood Agar. Ifthe colonies were Gram negative, then it was sub-cultured on Mac-Conkey Agar. Identification of the micro-organisms was done using various biochemical as well as routine tests.

Biochemical tests were included in order to identify Gram positive (Catalase, Coagulase, VP etc) and Gram negative bacteria (Catalase, Oxidase, SIM, TSI, Urease, O/F etc). The culture plates incubated for aerobic organisms were examined after overnight incubation. Identification of organisms was done by the standard microbiological technique which involves colony morphology, staining reaction and differentbiochemicalproperties.

The antibiotic susceptibility pattern was done by Kirby-Bauer disc diffusion method. Antibiotic discs were placed aseptically on a Muller-Hinton Agar (MHA) plate swabbed with test bacteria pre-grown to Mac-Farland Standard in nutrient broth (NB). The plate was then incubated at 37 C for 24 hours. The zone of inhibition (ZOI) around the disc was measured with a ruler and compared to standard interpretation charts. The quality of each test was maintained by using standard procedures. The quality of each agar plate prepared was ensured by incubating one plate of each lot in the incubator. Control strains of E. coli and Staphylococcus aureus were used for the standardization of the Kirby-Bauer test and also for correct interpretation of the zone of diameter. The quality of the sensitivity tests was maintained by maintaining the thickness of MHA at 4 mm and pH at 7.2-7.4. Strict aseptic conditions were maintained while carrying out all the procedures.

III. Results

A total of 100 patients were included in the study, of which the majority of patients were in the age group 50-60 (43%) years; females(52%) were more commonly affected than males(48%). Majority of patients belonged to low socioeconomic status(64%) and majority were housewives(39%), and the left eye was more commonly involved(56%). One hundred percent of the patients complained of epiphora and had mucopurulent regurgitant(71%) on sac syringing.

Table 1: Age-wise distribution of cases in the study group

Age(years)	No. of cases
40-50	39(39%)
50-60	43(43%)
60-70	18(18%)
Total	100

Table 2: distribution of presenting complaints in the study group

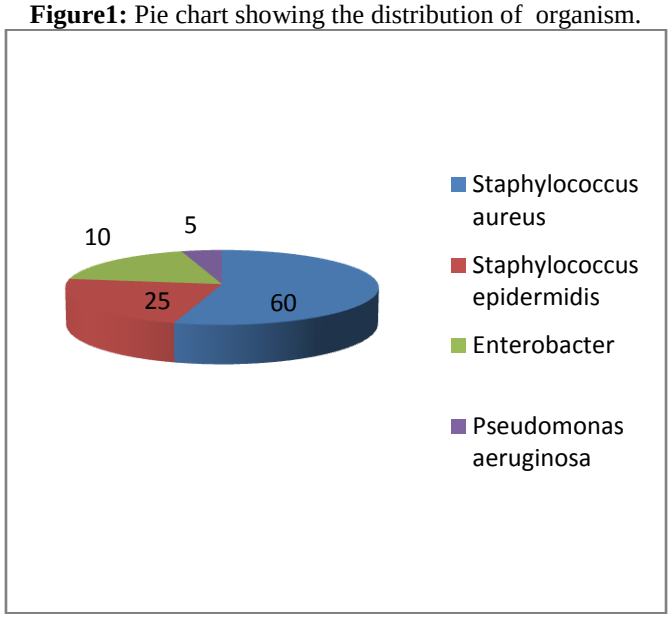
Clinical presentation	No of cases
Epiphora	100
Discharge	71
Swelling	40
Total	100

Out of 100 clinical samples, 20% were culture positive and the remaining were reported as having no growth(80%). Gram positive and gram negative organisms were both isolated. Among the gram positive organisms, Staphylococcus aureus(60%) was the most common organism isolated.Staphylococcusaureus was cultured on blood agar which showed hemolytic golden yellow colonies.

Table 3:distribution of Bacteriological isolates in the study group.

Bacterial Isolates	No of cases
Staphylococcus aureus	12
Staphylococcus epidermidis	5
Enterobacter	2
Pseudomonas aeruginosa	1
No growth	80
Total	100

Figure1: Pie chart showing the distribution of organism.



Most of the isolates of Staphylococcus aureus were sensitive to Vancomycin(100%),Azithromycin(85%),Ceftriaxone-sulbactam (80%),Amoxycillin-Clavulunic acid (75%) and Roxithromycin(40%). Most of the isolates were resistant to Penicillin (100%).

Staphylococcus epidermidis(25%) is the second organism to be found.It was cultured in blood agar. In blood agar it showed non hemolytic white colonies. Most of the isolates of Staphylococcus epidermidis were sensitive to Vancomycin(100%),Ceftriaxone-Sulbactam (80%), Azithromycin (80%), AmoxycillinClavulanic acid(60%) and Roxithromycin(40%). Most of the isolates were resistant to Penicillin(100%).

Among the gram negative organisms Enterobacter(10%) colonies were mainly isolated.Enterobacter colonies were cultured in blood agar which showed non hemolytic grey-white moist circular colonies and it fermented lactose on Mac-Conckey's agar.

Most of the isolates of Enterobacter were sensitive to Ceftriaxone-Sulbactam (100%), Meropenem(100%), Amikacin(100%) and Piperacillin(50%). All isolates were resistant to Cefpodoxime (100%) and Cefalexin(100%).

Pseudomonas aeruginosa(5%) isolates were found among gram negative organisms group.Pseudomonasaeruginosa isolates produced beta-hemolytic greenish spreading type of colonies on blood agar andnon lactose fermenting moist circular colonies on Mac-conckey's agar.

Pseudomonas aeruginosaisolates were sensitive to Meropenem(100%), Piperacillin(100%), Ceftriaxone(100%) and Amikacin(100%). All isolates were resistant to Cefpodoxime (100%) and Cefalexin(100%).

IV. Discussion

In our study, none of the patients showed bilateral disease and dacryocystitis was more commonly seen on the left side(56%) .Ghose et al.found that there was a relatively high incidence of disease on the left side(40%) as compared with that on right side(32%) similar finding were noted by Brook et al. In general the disease had a predilection to the left side, especially in female, because of their narrow bony canal.The nasolacrimal duct and the lacrimal fossa formed a greater angle on the right side than on the left side. All patients complained of epiphora(100%).Seventy percent of the patients had complaints of mucopurulent discharge and 30% presented with swelling over the lacrimal sac along with epiphora(38%) .

Sood et al.foundepiphora as the presenting complaint(49.3%),and 17.1%had pus regurgitation on pressing the inner canthus.In this study,51% of the patients had complete naso-lacrimal duct obstruction on sac syringing while 49% had partial nasolacrimal duct obstruction.Similar results were found in a study carried out

in 2008.On the basis of regurgitant on sac-syringing,71% patientshad mucopurulent discharge,19% had clear discharge and the remaining 10% had purulent discharge.

Of the 100 clinical sample evaluated, 20(20%) were culture positive and the remaining were reported of no growth 80(80%). Among gram positive growths, S.aureus was encountered as the most common isolate (60%), followed by S.epidermidis (25%), while among the gram negative organisms, Enterobacter(15%), P.aeruginosa(5%) were predominant. The antibiotic susceptibility pattern varies from region to region and with communities. This is because of emergence of resistant strains as result of indiscriminate use of antibiotics.

Most of the isolates of Staphylococcus aureus were sensitive to Vancomycin followed by Meropenem and Azithromycin. Most of the isolates of *P*.aeruginosa showed sensitivity to ceftriaxone and tazobactam. And most of the cases of Staphylococcusepidermidiswere sensitive to Vancomycin..

In a study conducted in 2011 involving 100 patients, both gram positive and gram negative bacteria were found to be equally distributed in the study. The most common organism was again S.aureus.[8]

In a recent study conducted in 2012 on 83 patients of chronic dacryocystitis, it was found that S.aureus and *P*.aeruginosa were the most common isolates and the gram positive isolates were most sensitive to vancomycin, tobramycin and linezolid. The gram negative organisms were more sensitive to tobramycin and gentamycin.[9]

V. Conclusion:

Indiscriminate use of antibiotics can give rise to emergence of resistant strains. At the same time, preoperative antibiotic prophylaxis is important in large volume cataract surgeries as widely practiced in our country.Outof total 100 samples, we found 80 samples negative for any bacterial isolates. It was mainly because, all the samples were of patients with chronic darcyocystitisand majority of them had been on antibiotic therapy in the past. Another reason for culture negativity of the samples might be due to fungal pathology behind this, which needs further studies on a large scale basis.

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