

A Bacteriological Study of Dacryocystitis in a Tertiary Care Hospital

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Abstract Dacryocystitis is an inflammation of the lacrimalsac and duct. It is an important cause of ocular morbidity both in children and adults. The study was conducted in Narayana Medical College Nellore. Demographic data of all patients like Age, Sex, Occupation and Socio economic status of patient, nature, duration of symptoms and other aspects mentioned in the proforma was included. Patients who had received either topical or systemic antibiotics for the past one week from their visit to the hospital were excluded. In the present study a total of 100 samples of patients were included in the study based up on inclusion criteria. Out of 100 cases under the study it is observed that the females affected were 51.43% in comparison with males 48.57%. Out of 100 cases which were obtained over a period of one year, 70 samples were culture positive and 30 samples were culture negative. Right eye involvement was noticed among 22 males (64.70%), and left eye 12 (35.30%), in females right eye involvement 12 (33.34%) and left eye involvement 24 (66.66%) was noticed. All cases or forms of Polymicrobial growth were observed in dacryocystitis. The commonest organism in acquired dacryocystitis was Staphylococcus aureus (42.8%) followed by Staphylococcus epidermidis (37.4%) and enterococci (8.57%). Escherichia coli was the common organism (8.57%) followed by pseudomonas aeruginosa (2.85%). Dacryocystitis was most common in females than men. Females of middle age and above had higher incidence of dacryocystitis. Left eye was involved more than right eye. Staphylococcus species were the most common pathogen followed by Escherichia coli in daryocystitis. Vancomycin, Amikacin, Imipenem and co-trimoxazole are suitable therapeutic option in dacryocystitis.

Keywords: Dacryocystitis, Antibiogram, Lacrimalsac, Staphylococcus, Escherichia coli.

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1. Introduction

Dacryocystitis is one of the most common diseases of the eye. It is an important cause of ocular morbidity both in children and adults. [1] Dacryocystitis is an inflammation of the lacrimalsac and duct. It may be congenital and acquired. Acquired dacryocystitis occurs in two forms: Acute and Chronic. [2]

Acute dacryocystitis is heralded by the sudden onset of pain and redness in medial canthal region which is caused by lacrimalsac distension and inflammation of less than 2 weeks duration. Obstruction of the nasolacrimal duct leading to stagnation of tears in pathologically closed lacrimal drainage system can results in dacryocystitis. [3] Obstruction of nasolacrimal duct may be an "idiopathic inflammatory stenosis (primary acquired nasolacrimal duct obstruction)" or may be secondary to trauma, infection, inflammation, neoplasm (or) mechanical obstruction (secondary acquired lacrimal drainage obstruction). Dacryocystitis is a common problem, yet there are relatively few studies describing the microbiological characteristics of lacrimal sac infection. [4] The microbiology of dacryocystitis may differ in acute and chronic infections. Acute dacryocystitis

is often caused by gram negative rods. [5] In chronic dacryocystitis, mixed bacterial isolates are common with the predominance of staphylococcus species and streptococcus pneumoniae. [5,6] Fungal infections caused by candida albicans and aspergillus species occurs infrequently. During the past 20 years there have been only a few studies on the bacteriology of dacryocystitis. According to them "CONS" and Staphylococcus aureus are the most frequently isolated organisms in lacrimalsac infections. [7] Chronic dacryocystitis may be present with a variety of symptoms including unilateral tearing and intermittent milky discharge that accumulates in the inner canthus. A non tender mass in the medial canthus that is reducible by finger -pressure is a common complaint. Definitive treatment of chronic dacryocystitis is achieved with "dacryocystorhinostomy". [8]

2. Material and Methods

The present study on dacryocystitis was carried out in Department of Microbiology, Narayana medical college Nellore, over a period of one year. The study was approved by Ethical Committee. Demographic and clinical data of all the patients like age, sex, occupation,

socioeconomic status of patient, nature, duration of symptoms and other aspects mentioned in the proforma were collected. After clinical diagnosis of dacryocystitis by ophthalmologist, specimen was collected with the help of ophthalmologist.

Specimen Collection: The surrounding area was aseptically cleaned to avoid contamination from the surface micro-organisms and samples were collected in two sterile swabs from lacrimalsac. It was collected either by applying pressure over the lacrimalsac and allowing the purulent material to reflux through the lacrimal punctum (or) by irrigating the lacrimal-drainage system with sterile swab and lacrimal syringing.

Exclusion Criteria: Patients who had received either topical or systemic antibiotics for the past one week from their visit to the hospital were excluded. The specimens were processed immediately in the following manner as, direct smear examination, culture on dried plates of maconkey's agar at 37°C for 18 to 24 hours and on 5% sheep blood agar and chocolate agar with 5-10% CO₂ atmosphere at 37°C for 24-48 hours. The identification of the bacteria was done by microscopy and biochemical tests using standard laboratory guidelines. The bacterial inoculums conforming by 0.5% macfarland's standard and antibiogram was performed on muller-hinton agar, by Kirby-bauer disc diffusion test and the zone of inhibition was measured and reported as susceptible (or) resistant.

3. Results

In the present study a total of 100 cases were included based up on inclusion criteria. Out of 100 cases which were obtained over a period of one year, 70 were culture positive and 30 were culture negative. Majority of single eye involvement was noticed in this study. Out of 100 cases under the study it was observed that the females were 51.43% and males 48.57%. Out of 100 cases pure growth was seen in majority of cases. Data of the study shows 30-60 years as the most common age group in dacryocystitis.

Table 1. Gender wise distribution of cases of dacryocystitis

SL.No	Gender	Acquired Dacryocystitis	Percentage
1	Males	34	48.57%
2	Females	36	51.43%

Table 1 shows out of total 100 study cases 70 [70%] were positive for acquired dacryocystitis among which 51.43% were females and 48.57% were males.

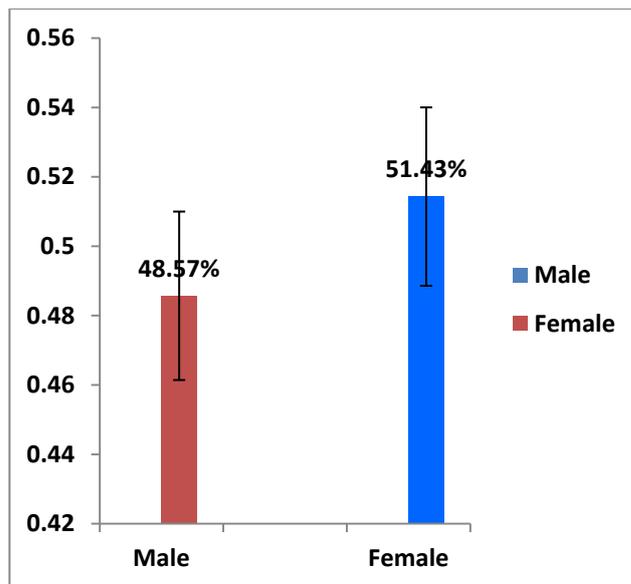


Figure 1. Graphic representation of distribution of dacryocystitis cases according to Gender

Table 2. Distribution of dacryocystitis cases according to gender and eye affected

SL.No	Gender	Right	Left
1	Males	22(64.70%)	12(35.30%)
2	Females	12(33.34%)	24(66.66%)
3	Total	34	36

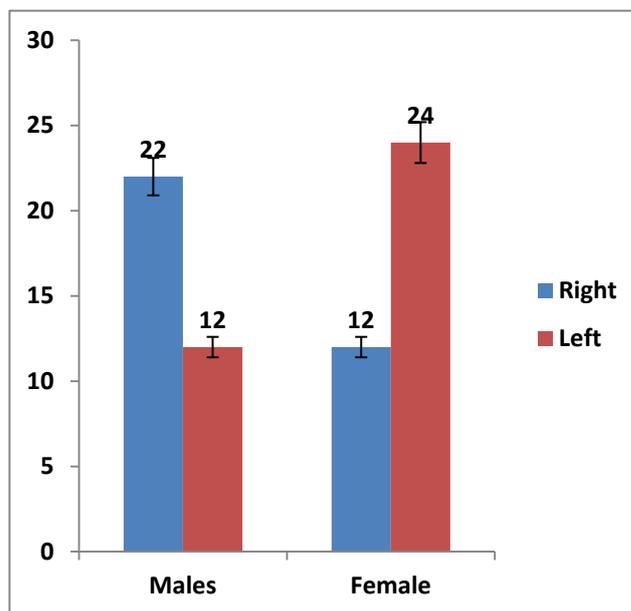


Figure 2. Distribution of dacryocystitis cases according to gender and eye affected

Table 3. Distribution of Gram positive pathogens isolated from dacryocystitis

SL.No	Organism	Total Number of Pathogens	Percentage (%)
1	Staphylococcus aureus	30	42.8%
2	Staphylococcus epidermidis	26	37.14%
3	Enterococci	06	8.57%

Out of the 100 samples in study period, 70 samples were culture positive and 30 negative.

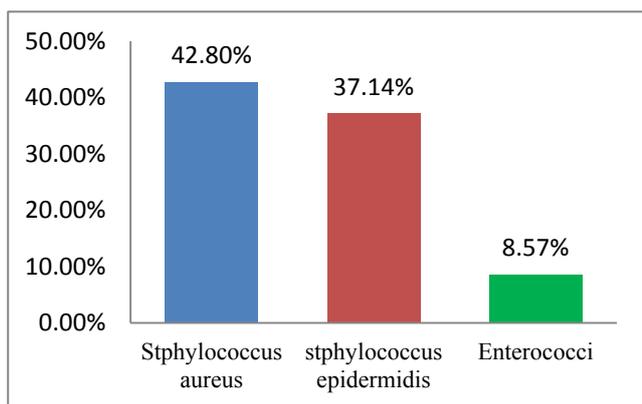


Figure 3. Graphic representation of Distribution of dacryocystitis cases according to spectrum of gram positive organisms

Table 4. Distribution of gram negative pathogens isolated from dacryocystitis

SL.No	Organisms	Total Number of Isolates (no=8)	Percentage (%)
1	Escherichia Coli	06	8.57%
2	Pseudomonas	02	2.85%

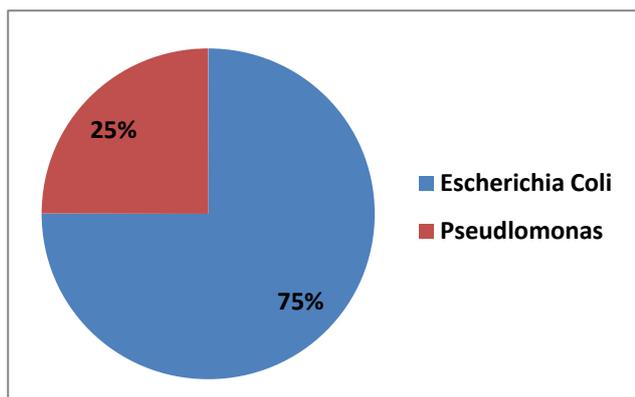


Figure 4. Distribution of dacryocystitis cases according to spectrum of gram negative organisms

Bacteriological analysis of the study was done. A total of 70 isolates were grown from 70 culture positive cases. Single isolate was recovered from all cases. All cases of polymicrobial growth were observed in dacryocystitis. The gram positive pathogens (62) were more common than gram negative pathogens (08). The commonest organism in acquired dacryocystitis was staphylococcus aureus as the most gram positive pathogen (42.8%) followed by staphylococcus epidermidis (37.4%) in dacryocystitis. Escherichia coli was the common organism (pathogen) (8.57%) followed by pseudomonas aeruginosa (2.85%) in gram negative pathogens. The antibiogram of the isolates was performed as per CLSI guidelines. The gram positive isolates were most sensitive to Vancomycin, Linezolid, Azithromicin, Amikacin (100%). Escherichiacoli showed maximum sensitivity to Imipenem (100%), Gentamicin (66.66%), Amikacin (66.66%) and Maximum resistance was exhibited to Ampicillin (0%) and Amoxy+CLAV (33.33). The analysis of the Antibiotic sensitivity clearly indicated Vancomycin and Linezolid as choice of drug for common pathogens encountered in dacryocystitis.

4. Discussion

Dacryocystitis is one of the most common diseases of the eye. It is important cause of ocular morbidity both in children and adult. Hence it requires special attention regarding the initiation of appropriate treatment. In the present study 100 clinically diagnosed cases of dacryocystitis attending ophthalmology outpatient department at Narayana Medical College Hospital, Nellore were studied.

Distribution of dacryocystitis cases shows that the infection is common in females 36 (51.43%) in comparison with males 34 (48.57%) which correlated the studies of Machin SJ et al [9] Badhu b et al, [10] predilection in females may be due to the smaller Nasolacrimal cannal diameter in females than men. [11]

Distribution of dacryocystitis cases according to gender and eye affected; In present study the involvement of eye is mainly unilateral either right or left. These correlates well with the study of Brook I et al. [12] There is a relatively high incidence of disease on left side as compared to right side these correlates well with Brook I et al [12] in Usha k et al [13] study right lacrimal sac was involved in 76 (40%) patients and left lacrimal sac in 60 (33%). Distribution of dacryocystitis cases according to number of organisms; In this study out of 100 samples, 70 samples were obtained, single organism were isolated 68 (98%) of the cases and mixed organisms in 02 (2%) which correlates with studies of Kundu Pk et al [14] 82.5%) and (10.5%).

Distribution of various organisms in dacryocystitis; In acquired dacryocystitis most common gram positive isolate is (Staphylococcus aureus) (42.8%) and most common gram negative isolate is Escherichia coli (8.57%) out of 70 isolates. This correlates with studies of Huber spitzy V et al [15] (50%) and (11.,7%).

Antibiogram pattern of organisms isolated from dacryocystitis cases: The antimicrobial sensitivity pattern varies from community to community. This is because of emergence of resistant strains as a result for indiscriminate use of antibiotics. The gram positive isolate were more sensitive to Vancomycin and Linezolid (100%) followed by Clindamicin (86%). The gram negative organisms were most sensitive to Imipenem, Co-trimoxazole 100% followed by Amikacin (66.66%) and Gentamicin (66.66%). Briscoe D et al [16] revealed that gram negative isolates were sensitive to Cefazidime in 95% Ciprofloxacin in 86% and Cefuroxime in 50% with a sensitivity of less than 30% of Cefalexin and Ampicillin. In Usha K et al [13] study gram positive organisms exhibited a high rate of sensitivity to Vancomycin, Chloramphenicol and Ofloxacin.

5. Conclusion

A total of 100 clinically diagnosed cases of dacryocystitis were processed in the present study among these 70 cases were culture positive and 30 cases were culture negative. Dacryocystitis was most common in women than men. Females of middle age and above had higher incidences of dacryocystitis. Left eye was involved more than right eye. In majority of cases the most common complaints was watering of eye associated with purulent discharge. The most common organism in acquired dacryocystitis was

(*Staphylococcus aureus*) followed by *Staphylococcus epidermidis* (cons). The gram positive isolates were most sensitive to Vancomycin, Linezolid, followed by Clindamycin and less sensitive to Pencillin. The gram negative organism were most sensitive to Imipenem, Co-trimoxazole followed by Amikacin and Gentamicin.

Conflict of Interest

None declared.

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