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Bacteriological Profile and Drug Susceptibility Patterns in Chronic Dacryocystitis Patients: A Rural Hospital Study

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Abstract

Introduction: Dacryocystitis is the inflammation of lacrimal sac. It mostly results from blockage of nasolacrimal duct. *Aim:* The study was carried out for detection and identification of causative bacterial agents and their Sensitivity to different antibiotics. *Materials and Methods:* One year study was carried out from March 2015 to Feb. 2016. Samples were collected with the help of sterile swab and further processed in the department of Microbiology. *Results:* Out of 66 cases were studied, 64 (96.96%) were culture positive and only 2 (3.03%) were culture negative. Gram positive organisms were most commonly isolated than Gram negative organisms.The most common bacteria isolated were the Coagulase negative staphylococci 41 (64%), Staphylococcus aureus 12 (18.75%), Staphylococcus epidermis 3 (4.68%), Klebsiella pneumoniae 3 (4.68%), Pseudomonas aeruginosa 3 (4.68%) and Streptococcus pneumonia 2 (3.12%). *Conclusion:* Dacryocystitis is the most frequent disease of lacrimal system and one of the most important cause of ocular morbidity. As majority of our population live in rural areas, knowledge of causative organisms and the susceptibility of the bacteria towards antibiotics plays major role in the management of these disease.

Keywords: Dacryocystitis; Lacrimal Sac; Nasolacrimal Duct.

Introduction

Dacryocystitis is one of the common eye disease.It is the inflammation of lacrimal sac [1]. It is classified under two broad headings Acute and Chronic type. Chronic dacryocystitis is commoner, commonly associated with partial and total obstruction of nasolacrimal duct. The obstruction of canal leads to stagnation of tears and favors the pathological environment [2,3]. The healthy lacrymal passages are free from infective microorganisms partly due to resistance of mucosa itself and partly due to the bacteristatic influence of the tears [4,5,6]. The normal flora of the eye and the nose acts as an opportunistic pathogens and cause infection of lacrimal sac.Treatment of dacryocystiti is surgery, either external or endonasal dacryocystorihnostomy or occasionally silicon intubation [4]. Delay in management can lead blindness. Hence the study was carried out to find out the bacteria responsible to cause dacryocystitis and to study their antibiogram which guide in formulation of exclusive management protocols.

Aims and Objectives

Detection and identification of causative bacterial agents and their Sensitivity to different antibiotics.

Materials and Methods

One year study was carried out from March 2015 to Feb. 2016. The study was carried in outpatient

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department of Ophthalmology in collaboration with Microbiology department. Samples were collected with the help of sterile swab and further processed in the department of Microbiology.

Inclusion Criteria

1. Cases of chronic dacryocystitis which were clinically diagnosed.
2. Patient with previous episodes of acute dacryocystitis.

Exclusion Criteria

1. Congenital dacryocystitis.
2. Patient who had received either topical or systemic antibiotics in past one week.

The study carried out on 66 samples, collected from 63 patients by applying pressure over the lacrimal sac and purulent material was collected by two sterile cotton swab from conjunctiva and nose. Collected material were subjected to Gram staining and culture. For culture specimens were inoculated on Blood agar, MacConkey agar, incubated at 37^0C, overnight in incubater.

Bacteriological identification was done by seeing colony morphology and by standard protocols [8]. Antimicrobial susceptibility testing was done by Kirby-Bauer disc diffusion method as per Clinical Laboratory Standard Institute guidelines [5,7].

Results

A total of 63 patients with the clinical diagnosis of dacryocystitis were enrolled for the study. A maximum of patients were from the age group 61-70 years (6^{th} decade) i.s. 26 (41.26%) followed by patients in the age group 51-60 years (5^{th} decade) i.s. 20 (31.74%) given in Table 1.

There was female predominance i.s. 47 (74.60%) which is shown in the Table 2.

In our study maximum age was 85 and 81 years of male and female patient respectively. The minimum age was 40 and 42 years of male and female patient respectively as per Table 3.

The mean age as per our study was 60.76 years of total patients given in Table 4. In our study mean age of female patients was 64.19 years and that of male was 61.5 years shown in Table 4.

Bacterial etiology was seen in 64/66 (96.96%) patients presenting with chronic dacryocystitis. No organism was isolated in 2 (3.03%) patients as per Table 5.

The details of bacterial etiology are given in Table 6. Among the isolated bacteria, most of the organisms were Gram positive as compared to Gram negative organisms. Coagulase negative staphylococci was the most common GPC followed by Staphylococcus aureus.

Among GNB, the most common was Pseudomonas Aeruginosa, and Klebsiella Pneumoniae Antibiotic sensitivity patterns of Gram-positive cocci and Gram-negative bacilli are shown in Table 7.

Overall sensitivity testing against all bacteria shows most effective antibiotic against all organism is Moxifloxacin (92%) followed by Gatifloxacin (84.37%), Ofloxacin (84.37%), Ciprofloxacin (73.43%), Norfloxacin (60.93%), Cephalosporin (56.25%) Gentamicin (53.12%), Tobramycin (51.56%), Amoxicillin (50%), Cloxacillin (50%), Chloramphenicol (48.43%) and Tertracycline (48.43%).

Table 1: Age wise distribution

Age-Group	No. of Cases	Percent %
31-40	1	1.58
41-50	10	15.87
51-60	20	31.74
61-70	26	41.26
71-80	3	4.76
81-90	3	4.76
Total	63	100

Table 2: Distribution of gender among patients and number of positive samples

Gender	No. of Cases
Female	47(74.60%)
Male	16(25.39%)
Total	63(100%)

Table 3: Distribution of minimum and maximum age

	Female	Male
Minimum age	42 yrs	40 yrs
Maximum age	81 yrs	85 yrs

Table 4: Mean age of patients

Mean age of total patients	60.76 years
Mean age of females	64.19years
Mean age of males	61.5years

Table 5: Distribution of culture

Name of Organisms	Total
Coagulase negative staphylococci	41 (64.06%)
Staphylococcus aureus	12 (18.75%)
Staphylococcus epidermis	03 (4.68%)
Klebsiella pneumoniae	03 (4.68%)
Pseudomonas aeruginosa	03 (4.68%)
Streptococcus pneumoniae	02 (3.12%)
Total	64 (100%)

Table 6: Bacterial types isolated from patients with chronic dacryocystitis

Positive	64 (96.96%)
Negative	2 (3.03%)
Total	66 (100%)

Table 7: Antibiotic sensitivity pattern of organisms (isolates)

Name of organisms	G	Te	C	CF	AM	CLX	NX	OX	GATI	CHLOR	TB	MO
A	21	22	24	30	23	24	27	39	39	23	20	38
	51.21%	53.65%	58.53%	73.17%	56.09%	58.53%	65.85%	95.12%	95.12%	56.09%	48.78%	92.68%
B	8	4	7	8	4	5	6	7	7	3	6	11
	66.66%	33.33%	58.33%	66.66%	33.33%	41.66%	50 %	58.33%	58.33%	25%	50 %	91.66%
C	2	2	1	2	1	1	1	2	2	2	2	3
	66.66%	66.66%	33.33%	66.66%	33,33%	33.33%	33.33%	66.66%	66.66%	66.66%	66.66%	100%
D	1	1	2	2	2	1	1	1	2	2	2	2
	33.33%	33.33%	66.66%	66.66%	66.66%	33.33%	33.33%	33.33%	66.66%	66.66%	66.66%	66.66%
E	1	1	1	3	1	0	2	3	2	1	1	3
	33.33%	33.33%	33.33%	100%	33.33%	0%	66.66%	100%	66.66%	33.33%	33.33%	100%
F	1	1	1	2	1	1	2	2	2	0	2	2
	50%	50%	50%	100%	50%	50%	100%	100%	100%	0%	100%	100%

A-Coagulase negative staphylococci,B- Staphylococcus aureus,
C- Staphylococcus epidermis,
D- Klebsiella pneumonia,E- Pseudomonas aeruginosa,F- Streptococcus pneumonia
G-Gentamycin,Te-Teracyclin,C-Cephalosporin, Cf-Ciprofloxacin,
Am-Ampicillin,Clx-Cloxacillin,Nx-Norfloxacin,Ox-Ofloxacin,Gati-Gatifloxacin,Chlor-Chloramphenicol, Tb-Toramycin, Mo-Moxifloxacin

Discussion

In the present study of Chronic dacryocystitis the maximum number of patients were in the age group of 61-70 years (6^{th} decade) i.e. 26 (41.26%) followed by patients in the age group 51-60 years (5^{th} decade) i.s.20 (31.74%), Sergio Pinar-Sueiro et al showed similar results [20]. Arun Ghosh et al shows showed the highest number of dacyrocystitis among the people who belongs to 40 -49 years (53.33%) age group followed by those in age group of 30- 39 years (23.33%) [5]. In our study Females were affected more 47 (74.60%) than male 16 (25.39%). Arun Ghosh et al shows Females were more affected 19(66.33%) as compared to male 11(36.66%) [5]. These findings were correlated with the findings of different authors [4,7,9,10]. Females are more affected because they are having more oblique and narrow nasolacrimal [5]. In the present study, among the isolated bacteria,

most were Gram- positive organisms as compared to Gram –negative organisms. Arun Ghosh et al shows 22(75.86%) isolates were gram positive bacteria and 7(24.13%) isolates were gram negative bacteria [5]. Suharshi Gupta et al [4], Coden et al [11] and Bharati et al [10] reported that majority of the isolates were gram positive organisms. Coagulase negative staphylococci was the most common GPC 41 (64.06%) followed by Staphylococcus aureus 12 (18.75%). Yared Assefa et al showed similar findings [21]. Among GNB, the most common were Pseudomonas Aeruginosa 03 (4.68%), and Klebsiella Pneumoniae 03 (4.68%). Gram-negative bacilli were found to be less commonly occuring cause of adult dacryocystitis. Similar findings were reported by many others [2, 12,13,14,17,18,19]. In present study 2 (3.03%) showed sterile culture, Jyoti Bhuyan [2] Sood NN [12] Baleshwar Prasad[13] also reported sterile samples. While testing the sensitivity of various bacteria against commonly used antibiotics,shows most effective antibiotic against all organism is Moxifloxacin (92%) followed by Gatifloxacin (84.37%), Ofloxacin (84.37%), Ciprofloxacin (73.43%), Norfloxacin (60.93%), Cephalosporin (56.25%) Gentamicin (53.12%), Tobramycin (51.56%), Amoxicillin (50%), Cloxacillin (50%), Chloramphenicol (48.43%) and Tertracycline (48.43%) as observed by others [2,14,15,16].

Conclusion

In conclusion, this study of 66 cases carried out in Department of ophthalmology A.C.P.M. Medical college Dhule, Maharashtra, India, shows that most commonly affected patients were in the age group of 61-70 years (6^{th} decade) and female predominance was there. Coagulase negative staphylococci was the most common organism among Gram-positive isolates and the most effective antibiotics were Moxifloxacin, Gatifloxacin, Ofloxacin and Ciprofloxacin.

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