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Original Research Article

A study on Bacteriological profile of Dacryocystitis Cases attending to Government General Hospital, Anantapuramu

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ABSTRACT

Dacryocystitis is an infection of the lacrimal sac, usually occurs due to obstruction of lacrimal duct. Dacryocystitis can be caused by either gram positive or gram-negative bacteria, most commonly associated with gram positive organisms. The aim of the study is to find out the bacteriological profile of acute and chronic dacryocystitis. A total of 115 dacryocystitis patients attending to ophthalmology Out Patient Department during the year 2012 to 2015 were selected to do this study. Localized lesions were examined properly, also inspected other eye for any signs related to dacryocystitis. All patients were explained about dacryocystitis consequences, advised to undergo bacterial culture and sensitivity. Out of 115 subjects, 73 (63.4%) were presented with chronic dacryocystitis and remaining 42 patients (36.5%) were acute dacryocystitis. 84 (73%) patient's samples yielded growth on microbiological culture and 31 (26.9%) patients pus samples didn't yield any growth. On assessment of bacteriological profile of dacryocystitis, Staphylococcus aureus was the most common organism followed by Pseudomonas aeruginosa and Streptococcus pneumonia in Chronic dacryocystitis, whereas in acute dacryocystitis pseudomonas aeruginosa was predominant pathogen followed by Staphylococcus aureus and Escherichia coli. Microbiological assessment of pus samples helps us to diagnose and start appropriate treatment. Treatment should be promptly initiate as early as to avoid further complication related to dacryocystitis.

KEYWORDS: Bacteria, Dacryocystitis, Gram Positive

INTRODUCTION

Dacryocystitis is an infection of the lacrimal sac, usually occurs due to obstruction of lacrimal duct [1]. The main predisposing factor is closure of lacrimal duct at the junction of lacrimal sac, other factors are nasal deformities like nasal septum deviation, rhinitis, inferior turbinate hypertrophy, dacryoliths at various levels [2]. Dacryocystitis can be congenital or acquired. Acquired dacryocystitis is of two types based on the onset of infection: acute and chronic dacryocystitis [3]. Acute dacryocystitis is heralded by the sudden onset of pain, redness and swelling over medial canthal region, whereas chronic dacryocystitis is due to obstruction of the tear film along with debris and denuded epithelial cells [4,5]. Dacryocystitis can be caused by either gram positive or gram-negative bacteria, most commonly associated with gram positive organisms. Among gram positive organisms, Staphylococcus aureus and Streptococcus pneumonia are most commonly related to Dacryocystitis. Dacryocystitis can lead to corneal ulceration, orbital cellulitis, optic neuritis, proptosis and blindness [6]. The aim of the study is to find out the bacteriological profile of acute and chronic dacryocystitis.

MATERIALS AND METHODS

A Prospective study was done at Department of Ophthalmology and Microbiology, Government Medical College and General Hospital, Ananthapuramu for a period of 3 years from January 2014 to January 2017. Ethical committee approval was taken before doing this study. A total of 115 dacryocystitis patients attending to ophthalmology Out Patient Department during the year January 2014 to January 2017 were selected to do this study.

Patients history pertaining to presenting complaints such as age, sex, socioeconomic status, eye irritation, eye discharge, pain, swelling, redness, whether acute or chronic, frequent tearing, any significant history of trauma were collected. Localized lesions were examined properly, also inspected other eye for any signs related to dacryocystitis. All patients were explained about

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dacryocystitis consequences, advised to undergo bacterial culture and sensitivity.

Pus samples were collected and sent to Microbiology department. Samples were inoculated onto routine basal media such as nutrient agar, blood agar, MacConkey agar plates and incubated aerobically at 37 ^{0}C for 24 hours. On the next day colony characteristics were read, biochemical tests were done to identify bacterial pathogen. Antibiotic Sensitivity of the identified pathogens were done by Kirby-Bauer disc diffusion method with appropriate antibiotic discs. All the data including pathogens names were entered into spread excel sheet and evaluated the bacteriological profile of dacryocystitis.

RESULTS

Out of 115 dacryocystitis, 72 (62.6%) were males and 43 (37.3%) were females. Most of the patients presented to Out Patient Department with dacryocystitis were in the age group of above 40 years, 52.1% (60) followed by 21 (18.2%) patients in 31-40 years, 16 (13.9%) were in 21-30 years, 14 (12.1%) and 4 (3.4%) patients were in the age group of 11-20 years and 1-10 years respectively (Table No.1). Among 115 patients, most of them 33.9% and 29.5% were belong to lower middle class and upper lower class according to Kuppuswamy socioeconomic scale where education, occupation of the head of the family and family income per month were considered.

Most common presentation of acute dacryocystitis was swelling, pain, redness and the chronic dacryocystitis was tearing, formation of white plaque. Out of 115 subjects, 73 (63.4%) were presented with chronic dacryocystitis and remaining 42 patients (36.5%) were acute dacryocystitis (P-0.001, statistically significant). 84 (73%) patient's samples yielded growth on microbiological culture and 31 (26.9%) patients pus samples didn't yield any growth. On assessment of bacteriological profile of dacryocystitis, Staphylococcus aureus was the most common organism followed by Pseudomonas aeruginosa and Streptococcus pneumonia in Chronic dacryocystitis, whereas in acute dacryocystitis pseudomonas aeruginosa was predominant pathogen followed by Staphylococcus aureus and Escherichia coli (Table No:2).

Table No.1 Epidemiological factors of dacryocystitis

Epidemiological factors	No. of patients (n=115)	Percentage
Age		
1-10 years	4	3.4%
11-20 years	14	12.1%
21-30 years	16	13.9%
31-40 years	21	18.2%
41-50 years	34	29.5%
>50 years	26	.6%
Sex		
Males	72	62.6%
Females	43	37.3%
Socioeconomic status		
Upper class	8	6.9%
Upper middle class	16	13.9%
Lower middle class	39	33.9%
Upper lower class	34	29.5%
Lower class	18	15.6%

Table No.2 Various organisms isolated from Dacryocystitis

Organisms	Chronic Dacryocystitis		Acute Dacryocystitis		Total	
	n	%	N	%	n	%
Staphylococcus aureus	15	17.8	7	8.3	22	26.1
Streptococcus pneumonia	8	9..5	3	3.5	11	13
Pseudomonas aeruginosa	10	11.9	9	10.7	19	22.6
CONS	5	5.9	2	2.3	7	8.3
Other streptococci	2	2.3	0	0	2	2.3
Escherichia coli	6	5.9	5	5.9	11	13
Klebsiella species	4	4.7	1	1.1	5	5.9
Hemophilus influenzae	4	4.7	3	3.5	7	8.3
	54	64.2	30	35.7	84	100

n=No. of patients; %-Percentage

Gram positive organisms were shown 100% susceptible to vancomycin, teicoplanin, 90-95% were sensitive to Gatifloxacin, moxifloxacin, 85-90% were susceptible to ciprofloxacin, levofloxacin, 80-83% were susceptible to gentamicin, 70-75% were susceptible to amikacin, 60-65% were susceptible to cefazolin and 40-45% were sensitive to ampicillin.

Gram Negative organisms were shown 100% susceptibility towards meropenem, tigecycline, 85-95% susceptible to gatifloxacin, 75-85% were sensitive to ciprofloxacin, levofloxacin, 65-75% were susceptible to gentamicin, amikacin, 55-60% were susceptible to ceftriaxone, cefazolin, 30-40% were susceptible to ampicillin.

DISCUSSION

Obstruction of the nasolacrimal duct leads to stasis of the nasolacrimal fluid, which predisposes to infection. The obstruction can be due to idiopathic inflammatory stenosis or maybe due to trauma, infection, mechanical obstruction, inflammation, neoplasm. There is an about 60% chance of recurrence of dacryocystitis after initial attack [5].

Among different types of dacryocystitis, congenital dacryocystitis is associated with significant mortality and morbidity, if treatment is delayed there are chances that neonates can end up with complications of dacryocystitis [6]. Based on symptoms and signs can diagnose dacryocystitis clinically. Diagnostic methods available are Dacryocystography and dacryoscintigraphy, Subtraction DCG with a CT scan and other tests to rule out anatomical abnormalities [7].

In the present study, out of 115 dacryocystitis, 72 (62.6%) were males and 43 (37.3%) were females. Most of the patients presented to Out Patient Department with dacryocystitis were in the age group of above 40 years, 52.1% (60) followed by 21 (18.2%) patients in 31-40 years, 16 (13.9%) were in 21-30 years, 14 (12.1%) and 4 (3.4%) patients were in the age group of 11-20 years and 1-10 years respectively.

Bahrami Eshraghi et al [8] reported that dacryocystitis was more prevalent females when compared to males, with ratio of 1.78:1 and the mean age of dacryocystitis is 44 years. Dacryocystitis prevalence increases with increasing age and was predominantly documented in females [9].

Similar to this study, Bharathi MJ et al [10] conducted a large study on 1891 patients of dacryocystitis, documented that 70.1% patients had chronic dacryocystitis and 29.9% patients had acute dacryocystitis. Growth rate was shown in 70.1% of patients. Observed that culture positivity was higher in chronic (90%) than in acute dacryocystitis (57.4%).

On assessment of bacteriological profile of dacryocystitis, Staphylococcus aureus was the most common organism followed by Pseudomonas aeruginosa and Streptococcus pneumonia in Chronic dacryocystitis, whereas in acute Dacryocystitis pseudomonas aeruginosa was predominant pathogen followed by Staphylococcus aureus and Escherichia coli. Yanoff et al [5] also documented that Staphylococcus aureus is the most common pathogen isolated from dacryocystitis.

In similar to this study Bahrami Eshraghi et al [8] documented that Percentage of gram positive cultures was higher in chronic dacryocystitis than acute ones (82% vs 48% of positive cultures; P=0.003) and the most common pathogen isolated was Staphylococcus aureus was 26%. Bharathi MJ et al [10] reported that the predominant bacterial pathogen isolated from acute dacryocystitis was Staphylococcus aureus (22.3%) followed by Pseudomonas aeruginosa (21.1%) and from chronic dacryocystitis was coagulase-negative staphylococci (CoNS) (44.2%), S. aureus(10.8%), and Streptococcus pneumonia (10%). The highest percentage of bacterial isolates were susceptible to gatifloxacin (96.5%), ofloxacin (94.8%), and amikacin (91.1%). The percentage of resistance of bacterial isolates recovered from chronic dacryocystitis were found to be higher than that of bacterial isolates from acute infection. Streptococcus pneumoniae is frequently associated with corneal ulceration complication of dacryocystitis [11].

Treatment options for dacryocystitis are warm compresses, oral antibiotics, percutaneous abscess drainage, dacryocystorhinostomy. Definitive treatment is a dacryocystorhinostomy, which can be performed as an external or internal endoscopic procedure. Relative contraindications to an internal endoscopic approach would be possible retained foreign body, dacryoliths, suspicion of tumor, or difficult intraoperative nasal visualization.

CONCLUSION:

Chronic dacryocystitis is most common in prevalence when compared to acute dacryocystitis. Staphylococcus aureus is the most common pathogen found in dacryocystitis. Microbiological assessment of pus samples help us to diagnose and start appropriate treatment. Treatment should be promptly initiate as early as to avoid further complication related to dacryocystitis.

CONFLICT OF INTEREST: None

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