



Original Research Article

Bacteriological study of Chronic Dacrocystitis in adults

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A B S T R A C T

Keywords

Dacrocystitis,
Gram positive
cocci,
Epiphora

Dacrocystitis usually results from blockage of nasolacrimal duct. There is five fold risk of soft tissue infection after surgical intervention. The lacrimal excretory system is prone to infection and inflammation of various reason. The mucus membrane lined tract is contiguous with 2 surfaces (conjunctival and nasal mucosal) that are normally colonized with bacteria. The functional purpose of the lacrimal excretory system is to drain tears from the eye in to the nasal cavity. Stagnation of tears in a pathologically closed lacrimal system can result dacrocystitis. Purpose of the study is to determine the current bacteriology of dacrocystitis and their sensitivity to different antibiotics of bacterial isolates which were found in cases of dacrocystitis. Design of the study is retrospective. Thirty patients with dacrocystitis who attended to OPD, Department of ophthalmology, ENT at Rohilkhand Medical College and Hospital over a period of one year (31st August 2012 to 1st Sept,2013) were included in this study. Samples were processed in the department of Microbiology. The suspected patients of Chronic dacryocystitis were also referred to OPD, ENT for associated risk factors and nasal Pathology. Out of 30 patients 11(36.66%) males and 16(69.57%) female with chronic dacrocystitis were examined. The majority of cases 16(69.57%) were in between 40 to 49 years of age.. out of 30 cases 29(96.66%) were culture positive and only 1(3.33%) was culture negative. The most common isolates were *Staphylococcus aureus* 13(44.82%), *Staphylococcus epidermis* 4(13.7%), *Pseudomonus aeruginosa* 4(13.7%), *Streptococcus pneumoniae* 3 (10.34%) and *Klebsella pneumoniae* 2 (6.89%) respectively. *Staphylococcus aureus* gram positive cocci, which is more common is highly sensitive to ceftriaxone 12/13(92.30%), amikacin 12/13(92.30%), Cefotaxime 11/13 (84.61%),lmipenum 10/13(76.92%), Chloromphenicol 10/13(76.92%) respectively. Chronic dacrocystitis was the most common than acute type. Gram positive organisms were most commonly isolated than gram negative organisms.

Introduction

Inflammation of the lacrimal sac and duct is common, unpleasant trouble in some diseases. In the middle of first century AD, mentioned in literature George and Stahl (1702) of Halle. It occurs in three forms, acute, ulcerative, chronic dacryocystitis, preferentially over middle life, relatively rare in children and adolescents(1). In adult its overall incidence among females are quite high 70 – 80 % and 20 -40% are among males as per literature. Predisposition for the female is due to narrower lumen of the bony lacrimal canal. According to Santos Fernandez (1903 -21), Heinoneu(1920) Meller (1929), Ruiz Barreranco and Martinez Roman (1966). Dacryocystitis is more common in temperate climate, True (1900 -1926). Anatomical factor is one of most common etiological factor of dacryocystitis as described by Schaeffer (1920), Granstrom (1938) Sonderman (1923) has shown in their studies that constriction of lacrimal duct 40% moderate 29 % and 31% had normal lumen. Others Zabel (1900), Onodi (1913), Whithall (1912), Heninomen (1920) found that narrowing tends to occur in flat nose and narrow face. Harmer (1915), Bilancioni (1921) stressed on mechanical obstruction which plays important role in dacryocystitis. Klofler (1919 -1930), Stenger (1920) described in their studies that septal deviation leads to infection of the gland. Bacteriology of chronic dacryocystitis would contribute to the choice of effective antimicrobial agents and would also help in reducing the unnecessary load of antimicrobial agents. (2). Under normal condition mucosa of lacrimal sac is highly resistant to infection. However infection of sac and dacryocystitis can be triggered by distal obstruction of the nasolacrimal duct. (3). Acute dacryocystitis is an acute inflammation of lacrimal sac with tenderness and erythema of the overlying

tissues and 23% of eye might present with lacrimal abscess.(3,4). Dacryocystitis clinically characterized by epiphora and regurgitation of pus through punctum on pressure over sac and frequently caused by bacteria. Nasolacrimal duct (NLD) obstruction converts the lacrimal sac into a stagnant pool which becomes easily infected, leading to chronic dacryocystitis (5). With this background, the present study was undertaken to plan the treatment protocol for prevention.

Material and Methods

30 cases of diagnosed chronic dacryocystitis were studied over a period of one year. The samples from lacrimal sac and conjunctiva were collected with the help of ophthalmologist at out patient department of ophthalmic deptt, at Rohil khand Medical College and hospital, Bareilly after taking informed consent for the period one year. The surrounding area was cleaned aseptically to avoid contamination from the surface micro-organisms. Samples were collected in two sterile cotton swabs from lacrimal sac by applying pressure over the lacrimal punctum or by syringing. The samples were collected carefully without touching the lid margins and conjunctiva and sent to Microbiology lab for processing. One swab was inoculated without delay on the plates of MacConkey agar, 10% sheep blood agar and chocolate agar and another swab was used for gram staining. The stained smear was screened for pus cells and bacteria. The isolated organisms from culture were identified by using standard procedures.(6).

The sensitivity of the organisms was detected by Kirby –Bauer disc diffusion method as per clinical and laboratory standards institute (NCCLS) guidelines.(7) in Muller Hinton agar.

Results and Discussion

Out of 30 cases of clinically diagnosed chronic dacryocystitis cases 29 (96.66%) cases were culture positive and 1 case (3.33%) was sterile. (Table -6). Right eye was involved in 11(36.66%) cases and left eye was involved in 19(63.33%) of cases. (Table-3). Females were more affected 19(66.33%) as compared to male 11(36.66%), male to female ratio was -- ..(table-2). The study showed the highest number of dacryocystitis 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%), those in the age group 50 years and above (16.66%), those in the age group 20 -29 years (6.66%)(table- 1). In this study 22 cases(73.33%) presented epiphora, 4cases(13.33%) showed regurgitation of mucus and out of 4 cases, 2 cases (6.66%) presented with discharge and remaining 2cases(6.66%) presented with swelling of sac. Out of total 30 cases of chronic dacryocystitis 9 cases(30%) were associated with nasolacrimal duct obstruction, followed 7 cases(23.33%) were associated allergic rhinitis, 5cases(16.66%) presented with septal deviation, 3 cases (10%) were with bony deformity, and narrow face, flat nose, nasal polyps were in 2 cases(6.66%) each. (Table- 5).

Out of 29 positive culture, 22(75.86%) isolates were gram positive bacteria and 7(24.13%) isolates were gram negative bacteria. (table-6). The organism isolated are shown in(table-6). The most common positive isolate which identified was staphylococcus aureus 12(41.37%) and the most common gram negative isolate identified was Pseudomonas aeruginosa 4(13.7%) (table-6). The sensitivity pattern is as shown in (table-7).

Chronic Dacryocystitis is a common

ophthalmic disease in all over world. Therefore special attention is to be given in particular to its treatment. In the present study it was observed that females were most commonly affected. 19 cases (66.33%) were female and males were 11(36.66%) respectively among 30 cases of chronic dacryocystitis. This findings were correlated with the findings of different authors.(4,7,8,9,10). Females are more affected because they are having more oblique and narrow nasolacrimal duct. Hormonal imbalance in perimenopausal age group and lower socioeconomic status with poor personal hygiene also contributing factors which have predilection towards female preponderance (9). The highest number 16 (53.33%) of chronic dacryocystitis cases were observed in the 40 -49 years of age group. The findings of the present study was closure with the observation made by different authors(4,9,11'). The left eye was affected in 19(63.33%) patients. Chronic dacryocystitis is more common in left eye which is in close agreement with the study of other researchers.(9, 12,).

Dacryocystitis has long been noted to occur in the left side more frequently than on right side.(13). In the present study, 22(73.33%) patients had chief complain of symptoms of epiphora including excessive tearing and 4 cases (13.33%) were presented with mucus or pus like discharge from the puncta. This was in agreement with almost in close to so many authors like Hartikinen et al(14). Epiphora was common ophthalmic complaint that might be caused by anterior segment, eyelid and lacrimal drainage pathology (8,13). Chronic dacryocystitis patients of this study were associated with risk factors and nasal pathology. Mechanical nasal obstruction of nasolacrimal duct were observed in 9 cases(30.0%) which was in agreement with Bale (15) where he reported 28.60%.

Table.1 Age wise distribution of cases (n-30)

Age in years	No of cases	%
20 - 29	2	6.66
30 - 39	7	23.33
40 - 49	16	53.33
50 & above	5	16.66

Table.2 Sex wise distribution of cases (n-30)

Male	%	Female	%
11	36.66	19	66.33

Table.3 Distribution of Cases according to involvement of Eyes(n-30)

Eyes	No of cases	%
Right eye(RE)	11	36.66
Left eye (LE)	19	63.33

Table.4 Clinical pattern of chronic dacryocystitis (n-30)

Symtoms	No of cases	%
watering of eye (epiphora)	22	73.33
Regurgition of mucopus	4	13.33
Discharge	2	6.66
Swelling of lacrimal sac	2	6.66

Table.5 Distribution of cases associated with Risk factors (n-30)

Risk factors	No of cases	%
Mechanical obstruction of nasolacrimal duct	9	30.0
Allergic rhinitis	7	23.33
Septal deviation	5	16.66
Bony defects and Deformity	3	10.0
Narrow face	2	6.66
Flat nose	2	6.66
Nasal polyp	2	6.66

Table.6 Broad categories of isolates identified.(n-29)

Isolate Type	Number	%
Gram Positive Cocci	21	72.41
Gram Negative bacilli	06	20.68
Gram positive bacilli	01	3.44
Mixed type	01	3.44
Sterile Cultures	01	3.33

Table.6 Over all isolated organisms and their species(n-29)

Organisms isolated	No	%
<i>Staphylococcus aureus</i>	12	41.37
<i>Staphylococcus epidermidis</i>	4	13.70
<i>Streptococcus pneumoniae</i>	3	10.34
Mixed non haemolytic <i>Streptococci and Staph.epidermidis</i>	1	3.44
<i>Streptococcus pyogens</i>	1	3.44
<i>Pseudomonas aeruginosa</i>	4	13.7
<i>Klebsiella pneumonia</i>	2	6.89
<i>Haemophilus influenza</i>	1	3.44
<i>Diphtheroid</i>	1	3.44

Table.7 Antimicrobial Susceptibility test patterns of Bacterial Pathogens isolated from chronic dacrocystitis cases (n-29)

Bacterial Isolates	No%	Comon antibiotics tested, no (%)												
		P	AMC	AK	C	G	Cip	T	NOR	IC	CTR	TE	CTX	E
<i>Staph,areus</i>	13 (44.82)	0	5	12	10	9	6	7	5	10	12	3	11	4
<i>Staph.epidermis</i>	4 (13.79)	1	3	4	3	3	2	2	3	4	4	2	4	2
<i>Streptococcus pneumoniae</i>	3(10.34)	0	1	2	2	2	2	1	1	3	2	1	2	2
<i>Pseudomonas aeruginosa</i>	3 (10.34)	0	0	2	1	2	1	1	1	3	2	1	2	0
<i>Klebseilla pneumoniae</i>	2 (6.89)	0	1	2	2	2	1	1	1	2	1	0	1	0
<i>Haemophilus influenzae</i>	2(6.89)	0	1	2	2	2	1	0	1	2	2	1	2	1
<i>Streptococcus pyogens</i>	1 (3.44)	0	0	1	1	1	1	0	1	1	1	0	1	1
<i>Diphtheroid</i>	1 (3.44)	1	1	1	1	1	1	0	1	1	1	0	1	0

P-Penicillin,, AMC-amoxycillin, Clavonic acid,C-Chloromphenicol,G-Gentamycin,Cip-ciprofloxacin,T-Tobramycin, NOR-Norfloxacin, O-ofloxacin IC-Imipenem, CTR_Ceftriaxone,-TE-Tetracycline,CTX- Cefotaxime, E – Erthromycin.

In this study 75.86% culture showed gram positive bacteria which is in close with the

findings (9, 10, 16). In contrast Esharaghi B et al (17) isolated less number of gram

positive bacteria in culture accounting for 54%. Among the isolates, *Staphylococcus aureus* and *Staphylococcus epidermidis* were 41.37% and 13.70% which is near to the findings of Radha Krisna Mondal et al (9). where he reported 40% of *Staphylococcus aureus* and 10% of *Staphylococcus epidermidis* in their study. In contrast Eshraghi et al (17) reported 26% *Staphylococcus aureus* and 24.7% *Staphylococcus epidermidis* in their study. Pradeep A.V et al (16) and Kebede A et al (10) isolated *Staphylococcus aureus* in chronic dacryocystitis, 14.0% and 12.1% respectively, which are quite low compared with the present study. Third was *Streptococcus pneumoniae* 10.34% of the present study is similar with Radhakrishna Mondal et al (9) where he reported 10%. In contrast Kebede A et al (10) isolated *Streptococcus pneumoniae*, 23% where he narrated that *Streptococcus pneumoniae* is the prime pathogen among the patients of chronic dacryocystitis. Bale R.N et al (15) documented higher prevalence rate 30% of *Streptococcus pneumoniae* in his study. *Pseudomonas aeruginosa* yielded 13.7% among gram negative bacteria in the present study which correlated with the findings of RK Mondal (9) where he reported 16%.. more over Prakash et al (18) isolated *Pseudomonas aeruginosa* 14.9% from

The *Staphylococcus aureus*, most causative agent of this study was highly sensitive to ceftriaxone, amikacin, cefotaxime, Imipenem, chloromphenicol, and resistant to penicillin, and tetracycline. Other gram positive organisms were also showed same type of sensitivity.

Pseudomonas was effective to imipenem, ceftriaxone, cefotaxime and aminoglycoside group, ie amikacin, gentamycin etc. Organisms responsible for majority of the chronic dacryocystitis cases were due to

Staphylococcus aureus and sensitive to ceftriaxone, amikacin, cefotaxime, chloromphenicol.

Acknowledgement

We express our heartfelt gratitude to the Principal for his kind permission and staffs of Ophthalmology, ENT and Microbiology Department for their help.

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