



Clinicobacteriological Significance in Congenital Dacryocystitis

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Abstract

In the present study, 37 eyes of 30 congenital dacryocystitis patients (7 bilateral) were studied, out of which 60% of patients were male and 40% female. Gram positive cocci constituted the major bacterial isolate (56.7%) with *Streptococcus pneumoniae* (27.9%) predominating. Most effective antibiotics against the commonest organism *Streptococcus pneumoniae* were Tobramycin and Gentamycin showing 100% effectivity. *Staphylococcus albus* 17.4% was the most common normal conjunctival commensal isolated.

Key Words

Congenital Dacryocystitis, Antibiotic Sensitivity, Nasolacrimal Duct, Bacterial Isolate

Introduction

Congenital dacryocystitis is caused secondary to congenital abnormalities of the lacrimal drainage system. Impatency of naso-lacrimal duct at its lower end is the commonest cause of congenital dacryocystitis (1). It is due to an imperforate membrane at the lower end of naso-lacrimal duct and usually affects the babies with permanent closure of the Hasner membrane (2,3). In more than 90% of the new-borns, this membrane perforates spontaneously during first 4-6 weeks. Sometimes the perforation occurs after 6-12 months (4,5). After the age of 12 months a high pressure syringing to open the Hasner membrane is indicated (6). The two most important clinical features are persistent epiphora and regurgitation of mucoid or muco-purulent material on pressure over the sac. The present study was undertaken to know the common type of bacteria associated with congenital dacryocystitis and their antibiotic sensitivities & to guide the clinician better in his choice of medication.

Material and Methods

This prospective study was conducted on the patients attending the Out Patient Department of Upgraded Department of Ophthalmology for one year, in collaboration with the Department of Microbiology, Government Medical College, Jammu.

A total of 30 patients of either sex, involving both unilateral and bilateral cases were included in the study. The fellow unaffected eye in unilateral cases was taken as controls. Those cases previously surgically interfered with in the past were excluded.

The material for bacteriological analysis was taken from the affected eye in the form of regurgitant material or the conjunctival discharge itself, if there was no regurgitation. The material taken on sterile cotton-tipped swabs was streaked immediately on blood-agar and macConkey's agar plates and incubated at 37°C for 48 hours in a candle jar, before declaring them sterile. Bacteriological identification was based upon the colony morphology and biochemical tests (7). The organism

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isolated was then tested for sensitivity to various antibiotics by disc diffusion techniques (8). After the sample was taken, empirical treatment with chloramphenicol eye drops was instituted and if needed, the antibiotic changed later on according to the sensitivity report. Patients were followed upto complete cure, which was defined as the absence of watering and discharge. This was achieved either by medical means or surgical means which consisted of probing and syringing.

Treatment was applied step by step starting with conservative management in the form of lacrimal sac massage and antibiotic eyedrops and followed by lacrimal probing if required. Step by step approach for effective treatment of congenital nasolacrimal duct obstruction was followed as followed by previous studies (9,10). Conjunctival swabs were taken after complete cure and culture sensitivity testing was repeated.

Table 1. Sex Wise Distribution

Sex	No. of cases	Percentage
Male	18	60%
Female	12	40%

Table 2. Age of Onset of Symptoms

Age of onset of symptoms	No. of cases	Percentage
0-3 Weeks	27	73%
4-6 weeks	10	27%

Table 3. Age Wise Presentation

Age of presentation	No. of cases	Percentage
0-3 months	15	50%
4-6 months	8	26.7%
7-12 months	5	16.6%
13-24 months	2	6.7%

Table 4. Involvement of eye

Eyes involved	No. of cases	Percentage
Unilateral	23	76.7%
Bilateral	7	23.3%

Results

The bacteriological profile in the cases under study and their antibiotic sensitivity patterns are depicted in the following tables. Positive cultures were obtained in 27 eyes constituting 72.9% of total

Table 5. Presenting Symptoms

Presenting symptoms	No. of cases	Percentage
Epiphora	26	70.3%
Mucoid/Muco-purulent discharge	8	21.6%
Purulent discharge	3	8.1%

Table 6. Bacteria Isolated from 37 eyes (7 bilateral) with Congenital Dacryocystitis

Organisms	No. of eyes	Percentage
Streptococcus pneumoniae	11	29.7%
Staphylococcus aureus	6	16.2%
Staphylococcus albus	4	10.8%
Diphtheroids	3	8.1%
Citrobacter	2	5.4%
Proteus mirabilis	1	2.7%
Sterile	10	27.1%
Total	37	100%

Table 7. Normal Flora of Contralateral Eye

Organisms	No. of eyes	Percentage
Staphylococcus albus	4	17.4%
Streptococcus pneumoniae	2	8.7%
Staphylococcus aureus	1	4.3%
Diphtheroids	1	4.3%
Aerobic spore bearers (ASB)	1	4.3%
Sterile	14	60.9%
Total	23	100%



Table -8 Culture sensitivity

Organism	Cf	Tb	C	G	Va	Cz	Cx	T	E	Cp
Streptococcus pneumoniae	9 (81.8%)	11 (100%)	10 (90.9%)	11 (100%)	10 (90.9%)	10 (90.9%)	9 (81.8%)	9 (81.8%)	8 (72.7%)	10 (90.9%)
Staphylococcus aureus	4 (66.7%)	5 (83.3%)	5 (83.3%)	6 (100%)	5 (83.3%)	5 (83.3%)	4 (66.7%)	3 (50%)	3 (50%)	5 (83.3%)
Staphylococcus albus	3 (75%)	4 (100%)	4 (100%)	3 (75%)	4 (100%)	2 (50%)	3 (75%)	2 (50%)	1 (25%)	2 (50%)
Citobacter	2 (100%)	2 (100%)	2 (100%)	2 (100%)	2 (100%)	1 (50%)	2 (100%)	1 (50%)	1 (50%)	1 (50%)
Proteus mirabilis	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	0	0	0	0
Total (24)	19 (79.2%)	23 (95.8%)	22 (91.7%)	23 (95.8%)	22 (91.7%)	19 (79.2%)	18 (75%)	15 (62.5%)	13 (54.2%)	18 (75%)

Cf-Ciprofloxacin, Tb-Tobramycin, C-Chloramphenicol, G-Gentamycin, Va-Vancomycin, Cz-Ceftazidime, Cx-Cloxacillin, T-Tetracycline, E-Erythromycin, Cp-Cefpirome

Table-9 Medical vs Surgical Treatment

Mode of treatment	No. of eyes	Percentage
Medical	32	86.5%
Probing and syringing	5	13.5%
Total	37	100%

cases. 10 eyes (27.1%) had sterile culture. Gram positive cocci were the commonest type of bacteria isolated in 21 eyes (56.7%), of which Streptococcus pneumoniae was the predominant (29.7%) followed by Staphylococcus aureus (16.2%) and Staphylococcus albus (10.8%)

Staphylococcus albus (17.4%) was found to be the commonest normal conjunctival commensal isolated.

Sensitivity pattern was determined in a total of 27 organisms. The most effective antibiotics against all organisms were Tobramycin and Gentamycin each showing an effectivity of 95.8%. The most effective antibiotics against the most common organism Streptococcus pneumoniae were Tobramycin and Gentamycin both having 100% effectivity against the organism. 64.9% of the conjunctival cultures of the affected eye after complete cure were sterile as compared to 27.1% before treatment. Staphylococcus albus was the most common organism present in 21.6% of the cultures.

Table 10. Conjunctival Flora of Affected Eye After Complete Cure

Organisms	No. of eyes	Percentage
Staphylococcus albus	8	21.6%
Streptococcus pneumoniae	2	5.4%
Staphylococcus aureus	2	5.4%
Diphtheroids	1	2.7%
Sterile	24	64.9%
Total	37	100%

Discussion

Bacteriology of Congenital dacryocystitis acquires great significance in view of its bearing on the therapeutics of the disease. This study, therefore, deals with this problem in a systematic manner.

In our study of 30 patients, 73% had the history of development of symptoms during first three weeks of life. All of them were less than 2 years of age at the time of presentation with 76.7% of them presenting within first 6 months of life. 60% were males & 40% females with unilateral eye involvement (76.7%) more frequent than bilateral (23.3%). Epiphora was the presenting symptom in 70.3% of patients followed by muco-purulent discharge in 21.6% and purulent discharge in 8.1% of patients. Bareja U *et al* (11) studied 87 patients in 1990



and found unilateral eye involvement (69%) more frequent than bilateral (31%). Guerry D *et al* (12) in their study in 1948 found that 83% of their patients developed symptoms during first three weeks of life. All of them were less than 6 months of age with 100% of them presenting within first 6 months of life. 91.7% had unilateral and 8.3% bilateral involvement of eyes. Our study showed positive culture results in 72.9% of samples with gram positive cocci being the commonest type of bacteria isolated (56.7%). Out of these, Streptococcus pneumoniae constituted the major bacterial isolate (29.7%).

Pollard ZF (13) in their study in 1991 on a group of 25 patients of Congenital dacryocystitis also found Streptococcus pneumoniae (60%) to be the most commonly occurring organism followed by Staphylococcus aureus (20%). Kuchar *et al* (14) conducted their study in 2000 on a group of Congenital dacryocystitis patients & found 72.6% of cultures to be positive with Streptococcus pneumoniae (36.4%) being the leading bacterial isolate.

The most effective antibiotics against all the organisms were tobramycin and gentamycin (95.8%). Streptococcus pneumoniae showed 100% sensitivity to gentamycin and tobramycin.

Ghose *et al* (15) in 2005 and Usha *et al* (16) in 2006 also found similar results of culture sensitivity tests in their study. In our study Staphylococcus albus (17.4%) was found to be the most common normal conjunctival commensal as also found by Bareja *et al* (11) in their study in 1991.

Conclusion

Thus, bacteriology followed by sensitivity testing of various organisms to different antibiotics bears much significance with regards to therapeutics of the disease and guides the clinician better in his choice of medication. Our study therefore has been an attempt in this direction.

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