

A Clinical Study of Etiology and Pathogenesis of Chronic Dacryocystitis in A Tertiary Care Centre

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Abstract

Background: Dacryocystitis is infection of the lacrimal sac. It results from stasis of lacrimal secretions due to blockage of the nasolacrimal duct. The present study was done to determine the common causative bacteria and histopathological examination of lacrimal sac in chronic dacryocystitis.

Methods: About 50 patients of chronic dacryocystitis are selected. Samples from the contents of the lacrimal sac are collected from these patients and sent to microbiology department for culture for aerobic and anaerobic bacteria and fungi. Samples were collected from 13 patients who underwent dacryocystectomy.

Results: Fifty patients with an average age of 52.5 years (range, 6mths -70 years) of chronic dacryocystitis were identified. Female subjects (68%) predominated in the present study. As per the cultures from the nasolacrimal sac about 42 (84%) were positive for bacteria, mostly gram positive bacteria predominated by pneumococcus (40%). Non-granulomatous inflammation of the sac is observed in histopathological reports of all the 13 specimens.

Conclusions: Gram positive bacteria mainly pneumococci was the commonest pathogen isolated. In lacrimal sac biopsy, non-granulomatous inflammation consistent with chronic dacryocystitis is the most common finding.

Keywords: Dacryocystitis; Gram Positive Bacteria; Lacrimal Sac.

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Introduction

Dacryocystitis is one of the most prevalent ocular disease. Dacryocystitis has a worldwide distribution having a higher incidence among the people living in tropical countries. Commonly seen in people with poor hygienic conditions. It can be congenital or acquired. Most commonly seen in females probably because of narrow nasolacrimal duct and anatomical changes in the bony canal. The etiology of chronic dacryocystitis is complex and

has many causes. It may be inflammatory or non-inflammatory. Anatomical factors retarding the drainage of tears like neoplasms, foreign bodies, Dacryoliths, nasal polyps, deviated nasal septum, hypertrophied inferior turbinate etc. contribute to stasis and infection. It can be infective (Bacterial, viral and fungal), non infective (Atonic), it can be acute or chronic form [1].

Chronic dacryocystitis is more commonly seen than the acute form. The source of infection is either from conjunctival sac or nasal cavity. Bacteria like as Staphylococcus epidermidis, Staphylococcus aureus, Pneumococcus, Pseudomonas, E.coli, etc are the most common causative agents. Other rare causes of chronic dacryocystitis are granulomatous inflammation due to tuberculosis, syphilis, and fungi like Candida and Aspergillus.

Apart from its discomfort and social inconvenience, its perpetuation leads to a vicious circle of stasis and infection causing chronic irritative conjunctivitis and eczematous conditions of the skin of the lids.

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Among the acute and chronic forms, the latter being the most prevalent, amongst the general population. Acute exacerbation of chronic dacryocystitis leads to lacrimal abscess which eventually may rupture and heal spontaneously or form a lacrimal fistula.

An infected lacrimal sac (Chronic) is a constant source of infection and minor corneal abrasions may lead to corneal ulceration, if not treated timely may result in panophthalmitis, Hence any case of non healing corneal ulcer should always be tested for NLD patency and if found to be obstructed, Dacryocystectomy should be performed. Some other complications are intractable conjunctivitis, scleral abscess, facial cellulitis, orbital cellulitis, increased incidence of post operative endophthalmitis, and cavernous sinus thrombosis.

Umesh Bareja and Ghose isolated gram positive cocci with streptococcus pneumoniae predominating the cultures [4].

Purgason PA, Hornblass A, Loeffler M conducted a study which showed two cases of candida albicans as primary etiologic agent of dacryocystitis [5].

Surgery for sinus, nasal polyps, fractures of nose may act as a precipitating factor. Mauriello JA Jr., Fiore PM, Kotch M, described 66 year old women developing dacryocystitis unresponsive to medical management after 15 years of orbital floor fracture repaired with a silicone implant. Orbital computed tomography scan showed the silicon implant blocking the nasolacrimal sac and confirmed by probe test. Silicon implant is removed and dacryocystorhinostomy was done in that case of dacryocystitis [6].

Mauriallo et. al. reported inflammation or fibrosis but no tumors in histopathologic examination of 44 patients undergoing dacryocystorhinostomy [7].

Karesh JW, Perman KI, Rodrigues MM highlighted the important role of lacrimal sac biopsy in the absence of obvious tumorous involvement by reporting four patients who presented with a dacryocystitis secondary to lacrimal sac lymphoma [8].

To define the spectrum and relative incidence of the microorganisms causing chronic dacryocystitis.

To study histopathological picture of lacrimal sac in patients undergoing dacryocystectomy.

Methodology

The present study consists of 50 cases of chronic dacryocystitis including all age groups and of both

the genders, selected from the patients attending the OPD in the Department of ophthalmology during the year Feb 2016 to Nov 2017.

The present study was conducted upon the patients of all age groups, different occupations and socioeconomic status. Detailed clinical history was taken and proper evaluation was done. Lacrimal sac syringing was done and swabs were taken from the regurgitation samples without touching the skin, eyelids and conjunctiva and sent for culture to the microbiology department. Primary cultures require 24 hours to 48 hours.

Patients who underwent DCR were excluded as histopathological study could not be conducted in them.

Lacrimal Syringing was done as per the standard procedure. Regurgitated material from the lacrimal sac was collected first by applying pressure at the lacrimal sac region and if nothing was coming out then lacrimal syringing was done.

Microbiological Examination

It included Grams staining required to identify bacteria and their morphology which may show gram positive, negative cocci or bacilli, Zeil neelsen's Staining for mycobacterium. Bacterial culture was done for the identification of the exact causative organism whether aerobic or anaerobic organism in pure or mixed forms.

Ten percent (10%) Potassium Hydroxide smear was done to detect fungi like streptothrix and leptothrix. Culture in Sabouraud's Medium was done to identify fungal growth if any.

Histopathological Study

Histopathological examination of the lacrimal sac was done in patients who underwent dacryocystectomy. The lacrimal sac was examined histologically for chronic inflammation, any neoplasms, dacryoliths.

Results

A total of 50 cases were studied of which 16 (32%) were males and 34 (68%) were females. The incidence of chronic dacryocystitis is more among females 68% as compared to males 32%.

According to the present study, chronic dacryocystitis is more common among people in the age group of 50-59 yrs (32%). followed by the age group 60-69 yrs and 30-39 yrs (24% and 14%), Next

commonest age group is 40-49 yrs (12%) followed by 0-9 yrs (6%) and 70 and above (6%) and 20-29 yrs (4%). Least common age group was 10-19 yrs (2%). The youngest among the case studied was 6 months old and the oldest being 70 years.

Table 1: Age group distribution

Sl.No.	Age group (yrs)	No. of Cases	Percentage
1	0 - 9	3	6
2	10 - 19	1	2
3	20 - 29	2	4
4	30 - 39	7	14
5	40 - 49	6	12
6	50 - 59	16	32
7	60 - 69	12	24
8	70 and above	3	6
Total		50	

Chronic dacryocystitis has highest incidence in both males (12%) and females (20%) in 50-59 years age group. Next common incidence in 60-69 yrs (16%) females show similar incidence at 30-39, 40-49 years age (10%) followed by 10-19, 70 and above (4%). Least common age groups are 10-19 and 20-29 years (2% each).

Next common age group in males is 60-69 years (8%) followed by 30-39 years (4%). Common incidence of 2% is noted among 0-9, 40-49 and 70 and above age group. 10-19 years show no incidence of disease in one study.

Among the total number of 50 cases the left side affected was 24 (48%) and that of right side 14 (28%) bilateral 12 (24%) cases. According to the study left side is more commonly affected than the right side. The incidence of the disease in left side in female population was 19/34 cases, as against 9/34 cases having right side affection. The proportion of females having left side affected was 4 times that of males having left side affected. Where as the right side affection is 3 times and bilateral affection is equal in both the genders.

According to this study females mainly housewives (42%) are affected most commonly. Followed by Labourers (18%) and agriculturists (12%)

Incidence of chronic dacryocystitis is less common in preschool children, professionals, teachers and students. People belonging to low socio economic group are commonly affected by chronic dacryocystitis. It is less prevalent in urban population. Coming to the presenting features epiphora is more common. According to the present study 50% of cases presented with only epiphora and 40% of cases with epiphora and discharge

(mucous or mucopurulent or purulent).

Thirty four percent (34%) of patients presented with diminution of vision, due to cataract and were incidentally found having chronic dacryocystitis when investigating for cataract surgery. Epiphora associated with redness and swelling is evident in few patients (14%). Conjunctivitis with matting of lashes and oedema of lids were complained by 6% of patients. Corneal ulcer is seen in only one patient with chronic dacryocystitis.

As per the present study 80% of cases presented as Chronic dacryocystitis per se. About 12% of patients had associated mucocele. Third most clinical presentation was Congenital dacryocystitis, 6% in one study. Lacrimal abscess is the least common variety.

In the present study of 50 cases, 17 cases had ENT problems. Most common among them was DNS contributing to (58.8%) followed by hypertrophied inferior turbinate in about 5 cases (29.4%). One case each of maxillary sinusitis and nasal polyp were associated with chronic dacryocystitis.

Majority of the cases (70%) are associated with cataract. 25% of cases had chronic conjunctivitis either may be the cause or sequelae of chronic dacryocystitis. Corneal ulcer was seen in only one patient (4.16%). Diabetes mellitus was associated with 60% of cases and 40% of the patients were hypertensives. Chronic dacryocystitis was not due to systemic diseases.

Pneumococci is the most common causative organism contributing to 40% of samples studied, followed by staphylococcus (16%), Klebsiella (12%), Pseudomonas, E. coli, Diphtheroids (4%) each, Non-fermenting gram negative bacilli, Beta-hemolytic streptococci (2% each) in a descending order. Out of 50 samples 8 samples were sterile.

Table 2: Microorganisms distribution

Sl. No.	Organisms	No. of Cases	Percentage
1	Pneumococci	20	40
2	Klebsiella	6	12
3	E. Coli	2	4
4	Staphylococcus	8	16
5	Non-fermenting Gram negative bacilli	1	2
6	Pseudomonas	2	4
7	Beta hemolytic streptococci	1	2
8	Diphtheroids	2	4
9	Sterile	8	16
Total		50	

Macroscopic Appearance

Out of the 13 patients operated for chronic dacryocystitis by dacryocystectomy, 10 patients showed enlarged sac with thick wall and soft feel which were included in type I appearance and type II appearance showed shriveled up, atrophic sac with thin wall constituted 3 cases .

Microscopic Appearance

In the present study of 13 cases, chronic catarrhal type constituted 46.15% (6 cases), fibrotic type 23.07% (3 cases), follicular type 15.38% (2 cases), one case each of non-specific and hyperplastic type 7.69%. Chronic catarrhal type was the most common variety found and the next common in sequence were fibrotic, follicular, hyperplastic and non specific type.

Discussion

Chronic dacryocystitis is multifactorial. The pattern of incidence, age group affected, etiology of the disease varies in different studies.

According to the present study 6th decade (32%) was the most common age group affected which correlated well with the results of the study conducted by Chaudhry I A21, and by Jauko Hartikainen [3].

In the present study incidence of chronic dacryocystitis was found to be more common in females (68%) which correlated well with Chaudhry IA, and Jouko Hartikainen, Duke - Elder [10].

Coming to laterality, Left side (48%) is relatively more affected than right side (28%). This correlated well with P. Shiva Reddy 22 studies. In general the disease has predilection to left side especially in females because of narrow bony canal.

Chronic dacryocystitis is more common among females. 21 Majority of the females are housewives (42%). Most of them belong to low socioeconomic status.

The rate of infection is more common among males who belong to agricultural labourer group (18%) because of occupational exposure and poor hygienic conditions.

Epiphora is the main presenting feature (50%) followed by epiphora with discharge (40%). This correlated with the results of Jouko Hutikainen. (76%) [3] and P. Shiva Reddy (80%) [22]

Few patients had epiphora with mucocele (14%) in our study ,which correlated with P. Shiva Reddy

(25%) [22] study. Redness and stickiness of lids constituted (14%) of cases in our study and more incidence was seen in Prof. P. Shiva Reddy studies [22] (75%).

In the present study Chronic dacryocystitis without associated mucocele or lacrimal abscess was the most frequently encountered clinical type (80%) on par with the results of Sood. N.N [23] (66%). The next common presentation was mucocele (12%). The incidence of Congenital dacryocystitis and lacrimal abscess was (6%, 2%) respectively.

Cataract was the most commonly associated ocular condition (70%) and were found having chronic dacryocystitis during pre operative checkup, followed by chronic conjunctivitis (25%) followed by corneal ulcer (4.16%).

According to the present study conducted (34%) of cases had nasal and paranasal pathology which is comparable to Rajeev N. Bhale [24] study showing (29%). DNS was the common nasal pathology observed constituting (58.8%) of total cases followed by hypertrophied inferior turbinate (29.4%).

In our present study, diabetes mellitus was the most common associated systemic condition (60%) followed by hypertension (40%).

Microbiological Study

In our present study Pneumococcus was the most common causative organism (40%). Blockage of NLD by common nasal commensals resulting in improper drainage of lacrimal secretions and stasis followed by secondary infection contribute to chronic dacryocystitis. These organisms are seen in the regurgitant material. Since, pneumococcus is the most common naso pharyngeal commensal, it's the most common organism isolated in the cultures. Our present study correlated fairly well with Umesh Bareja 4 (28.9%), but poorly with Coden et al. 25 (2.3%) study, which has shown staphylococcus species as commonest organism cultured (64.5%).

Staphylococcal (16%) was the second commonest organism isolated in the present study which correlated with Jouko Hartikainen [3], Coden et al. [25], Umesh Bareja [4] their percentages being (47%, 27.3%, 13.2%) respectively.

Klebsiella species was the next commonest organism isolated (12%), which is in correlation with other studies of Rajeev N Bhale (1.63%) [24], Jouko Hartikainen (1.3%) [3].

Pseudomonas aeruginosa constituted 4% which correlated with Jouko Hartikainen [3] (9%) study.

In the present study 16% cases were sterile, which can be compared to Jouko Hartikainen [3] (15.7%), Umesh Bareja [4] (82.5%) studies.

In the present study no fungal isolates were seen.

Histopathological Study

The histopathological examination of the excised lacrimal sac showed non granulomatous type of dacryocystitis.

Non granulomatous inflammation consistent with dacryocystitis is the most common diagnosis in our study (100%) which correlated well with Anderson NG [26] study (85.1%) and Maureillo JA Jr [27] study (89%).

The limitation of the present study was investigations like dacryocystography and dacryoscintigraphy were not done.

Conclusion

Chronic dacryocystitis is the most commonly seen ocular adnexal disease.

Chronic dacryocystitis shows highest incidence in sixth decade of life, more common in females than in males, more common among people of poor socio economic group. No organisms were isolated from congenital dacryocystitis cases studied. Epiphora was the most common presenting feature.

Most of the cases (70%) were diagnosed of having chronic dacryocystitis incidentally while investigating a case of cataract. DNS was the predominant nasal association. Majority of patients had associated diabetes mellitus.

Most common organism isolated was pneumococcus. Non-granulomatous inflammation was the most common type of inflammation in histopathological study.

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