A CLINICO-BACTERIOLOGICAL STUDY OF LACRIMAL REGURGITATE IN CHRONIC DACRYOCYSTITISPramod Kumar Chhawania¹, H. R. S. Chauhan²**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: Dacryocystitis is the inflammation of lacrimal sac which is very common and unpleasant disease which presents a constant source of infection to the eye. The inflammation usually occurs due to obstruction of nasolacrimal duct. A prospective study was conducted in the Department of Ophthalmology and Department of Microbiology of G. R. Medical College, Gwalior (M. P.) from Oct. 2012 to Oct. 2013. Hundred consecutive cases of lacrimal regurgitate were studied. Method conducted by way of collection of sample with all adequate aseptic precaution, right microbiological processing and preparation of smear with the help of gram's staining. The commonest age at which the dacryocystitis was found in 30-60 yrs age groups (64%), with female preponderance (78.1%) of lower - lower socioeconomic group. The study suggests the most common bacteriological isolates prevailing in patients of chronic dacryocystitis was staphylococcus epidermidis (Gram positive coagulase negative).

KEYWORDS: Dacryocystitis, regurgitate, lacrimal sac, glucose broth, blood agar media.

INTRODUCTION: Inflammation of the lacrimal sac is a very common and unpleasant disease presenting a constant source of trouble. Epiphora is the most important and presenting symptom of chronic dacryocystitis.¹ Dacryocystitis is an inflammation of the lacrimal sac which usually occurs because of the obstruction of the nasolacrimal duct. Other causes may be stenosis of puncta, fibrosis of puncta and other inflammation of the nasolacrimal passage. Obstruction of the nasolacrimal duct leading to stagnation of tears in a pathologically-closed drainage system can result in dacryocystitis. Studies suggest that most common pathologic organism² is Coagulase-negative staphylococci, staphylococcus aureus is another frequent pathogen. Distinct patterns of geographical variation in terms of etiology according to the local climate in infective keratitis and also in microbial conjunctivitis.

MATERIAL AND METHODS: A prospective study was conducted in Department of Ophthalmology and Department of Microbiology of G. R. Medical College, Gwalior (M. P.). The period of study was from Oct. 2012 to Oct. 2013 covering 100 consecutive cases of lacrimal regurgitate in chronic dacryocystitis. Samples were collected from all the cases under complete aseptic precautions and were subjected to culture and susceptibility test.

Following criteria were applied for the diagnosis of chronic dacryocystitis: (a) H/o watering and/or discharge over a long period and (b) Presence of blockage in the lacrimal passage as evidenced by regurgitation test and syringing.

On the very first day regurgitative material was collected for bacteriological examination. Special care was taken not to use any chemotherapeutic or antibiotic agent before collecting the sample.

Patients with previous DCR surgery, antibiotic therapy, acute dacryocystitis and patients with age under 15 years were excluded.

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Careful examination of the patient was done for any fistula swelling or scarring in the lacrimal sac area.

Regurgitation test was done by pressing at the lacrimal sac area. Syringing was carried out in patients where regurgitation test were negative.

Routine ENT examination was done for any ENT pathology.

Technique of Collection of Regurgitate from Lacrimal Sac for Bacteriology: Sample of regurgitative material was taken by sterile swab under all aseptic precautions and directly inoculated in glucose broth.

Other culture media used were nutrient agar media, Mac-Conkey media, blood agar media, peptone water and sugar media.

Microbiological Processing: By specimen of regurgitative material inoculated in glucose broth¹ were inoculated on blood agar, nutrient agar with the help of inoculation loop and were incubated at 37°C for 24 hours. If no growth was observed after 24 hours, the plates were further incubated for 48 hours.

After incubation the plates were observed for growth, if no growth was observed after 12 hours incubation the sample was reported sterile. Any growth on the plates was identified with standard microbiological techniques.

Preparation of Smear: A loop full of sterile saline was put on a clean grease free glass slide. With the help of loop, an isolated colony was transferred to the drop of saline on the slide. It was thoroughly emulsified and spread evenly. The film was dried and fixed by passing the slide 3-4 times over the flame.

Staining of Smears: Staining of smears was done by Gram's technique.

Identification of Organism: Isolated colonies from plates were picked up by a loop and inoculated in peptone water² media and incubated for 24 hours at 37°C. Culture from peptone water were transferred to sugar medium prepared for glucose, lactose, mannitol, sucrose and maltose by addition of 1gm of the sugar to 100 cc of peptone water (1%). Andrade's reagent was added as an indicator and Durham's tube included for the study of gas formation. The tube showing pink colour indicated acid formation whereas collection of bubbles in Durham's tube showed gas formation.

RESULTS: Hundred cases of chronic dacryocystitis were studied in the Department of Ophthalmology and Microbiology of the J. A. Group of Hospitals, Gwalior from Oct. 2012 to Oct. 2013.

Age (yrs.)	No. of Cases	Percentage
10-20	05	05%
21-30	17	17%
31-40	17	17%
41-50	12	12%
51-60	25	25%
61-70	18	18%
> 70	06	06%
Total	100	100%

Table 1: Age Distribution

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Maximum number of cases (64%) were observed in age group 30-60 years and lowest number of cases (5%) were found in second decade.

Age (yrs.)	Male		Female	
	No. of Cases	Percentage	No. of Cases	Percentage
10-20	02	02%	03	03%
21-30	04	04%	13	13%
31-40	04	04%	13	13%
41-50	-	-	12	12%
51-60	05	05%	20	20%
61-70	02	02%	16	16%
> 70	02	02%	04	04%
Total	19	19%	81	81%

Table 2: Sex Distribution

The above table shows that the females were found to be approximately four times (81:19) as commonly affected as compared to males. Most common age was observed between 51-60 years in both males and females.²

Total no. of Cases		I-Upper		II-Middle Upper		III-Middle Lower		IV-Lower Upper		V-Lower Lower	
No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
100	100%	-	-	06	06%	09	09%	10	10%	75	75%

Table 3: Social Status in Chronic Dacryocystitis

Maximum cases of chronic dacryocystitis belongs to lower lower class (75%)^{2,3} and non of the cases belongs to upper class.

Etiological Factors	No. of Cases	Percentage
Chronic Simple Conjunctivitis	04	04%
Nasal and Sinus infection	65	65%
Heat and dust	35	35%
Chicken pox	28	28%
General infections e. g. measles, mumps influenza	-	-
TB	02	02%
Syphilis	-	-
Leprosy	-	-
Foreign body	-	-
Trauma	-	-
Heredity	02	02%

Table 4: Etiological Factors in Chronic Dacryocystitis

The commonest factor found in 65% of cases was nasal and sinus infection.²

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Features	No. of Cases	Percentage
Deviated nasal septum	49	49%
Hypertrophied inferior turbinate bone	41	41%
Rhinitis	10	10%

Table 5: The Finding of Nasal Examination in Chronic Dacryocystitis

Symptoms	No. of Cases	Percentage
Watering	100	100%
Discharge (Purulent/Mucopurulent)	45	45%
Redness of eye	04	04%
Swelling of lacrimal sac region	22	22%
Discharge through fistula	07	07%

Table 6: Incidence of Symptoms in Chronic Dacryocystitis

Table shows that in chronic dacryocystitis watering was found in 100% of cases whereas discharge (Purulent/mucopurulent) was found in 45% cases.

Associated Ocular Finding	No. of Cases	Percentage
Lacrimal sac - swelling	22	22%
Lacrimal fistula	09	09%
Positive regurgitation test	45	45%
Conjunctival - Hyperemia	34	34%
Corneal - Ulcer	04	04%
- Opacity	11	11%
Anterior chamber - Hypopyon	02	02%

Table 7: Associated Occular Finding in Chronic Dacryocystitis

Table shows swelling in the lacrimal sac region was found in 22% of cases and positive regurgitation was found in 45% of cases.^{2,4}

Organism	No. of Cases	Percentage
Staphylococcus epidermidis	28	38.88%
Staphylococcus aureus	13	18.55%
Streptococcus pneumonia	12	16.66%
Staphylococcus viridians	3	4.16%
E. coli	3	4.16%
H. influenzae	2	2.76%
Staphylococcus pyogenes	1	1.38%
Staphylococcus aureus mixed with Streptococcus pneumonia	4	5.55%
Staphylococcus aureus mixed with E. coli	2	2.76%
Staphylococcus aureus mixed with H. influenzae	1	1.38%

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Streptococcus pneumoniae, H influenzae mixed with streptococcus pyogenes	1	1.38%
Staphylococcus epidermidis mixed with streptococcus pyogenes	1	1.38%
E. coli mixed with streptococcus viridians	1	1.38%
Total	72	100%

Table 8: Bacteriological Examination of Sac Contents in Chronic Dacryocystitis

Commonest organism isolated was Staphylococcus epidermidis^{3,5} which was found in 40.26% cases followed by Staphylococcus aureus 28.23% and Streptococcus pneumoniae in 23.58% cases.

DISCUSSION: Inflammation of lacrimal sac has been known from early times due to its invariable tendency to produce cosmetic defects on face.

In the middle of the first century, Vesalius and Fallopius recognized nasolacrimal passage system accurately. The etiology of chronic dacryocystitis is not yet fully understood.

Normally the lacrimal sac and the nasolacrimal duct comprise continuous one functioning tube. It is lined by delicate mucosa which is exposed to infection. The lower end of this tube i. e. the nasal duct is especially vulnerable and likely to upset the whole delicate mechanism.

Age Incidence: The commonest age at which chronic dacryocystitis^{2,4} was found between 30-60 years of age (64%).

Sex Incidence: The adult female preponderance^{4,5} has been well established. In the present study, female dominated (78.1%).

Socioeconomic Status: Around 75% of the chronic dacryocystitis cases belonged to lower socioeconomic group.

Neighbouring Infections: In the present study, 65% of cases were found to have nasal and sinus infection which is in agreement with other workers.

Clinical Features: Conjunctival hyperemia (Angular conjunctivitis)^{2,3} were found in 34% of cases. Swelling of lacrimal region was found 22% of cases.

Swelling of the lacrimal Region: It was found in 22% of cases including solitary case of encysted mucocoele.^{2,4}

Corneal Ulcer: In the present study, 4 cases (4%) in chronic dacryocystitis had corneal ulcer which did not heal for 2 months but healed after dacryocystectomy. There was corneal opacity 11% of cases of chronic dacryocystitis.

Bacteriological Examination: The commonest organism² isolated by Staphylococcus epidermidis which was found in 40.26% cases followed by Staphylococcus aureus 28.23% and Streptococcus pneumoniae in 23.58% cases.

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Mixed infection was found in 10 cases (13.82%) out of which in 9 of cases multiple bacteria were found. In 4 of these cases, there was staphylococcus aureus mixed with streptococcus pneumoniae, in other two cases there was staphylococcus aureus mixed with E. coli. and in one other case there was staphylococcus aureus was mixed with H. influenzae was found. 28% of cases did show growth of any organism.

CONCLUSION: In the present study, it was concluded that most common bacterial isolate prevailing in the patients of chronic dacryocystitis in this geographical area are the Staphylococcus epidermidis (Gram positive, Coagulase Negative).

BIBLIOGRAPHY:

1. Duke Elder, 1974, System of ophthalmology. Text book of ophthalmology, vol. XIII: part II, p. 699-731, Henry Kimpton, London.
2. Reddy S., Reddy B., 1955, Clinicopathological study of chronic dacryocystitis. J.A.M.A. 24:413.
3. Prasad B, Ram D, 1958, Bacterial flora in chronic dacryocystitis J. Ind. Ophthal Soc. 6:68-70.
4. Agrawal M.L., 1958, Dacryocystography in chronic dacryocystitis. Thesis for M.S. (Ophthalmology), Vikram University, page 23.
5. Mittal P.C., 1964, Clinicopathological study of cases of chronic dacryocystitis. Thesis for M.S. (Ophthalmology) Vikram University.

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