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ACUTE DACRYOADENITIS — ANALYSIS OF 23 CASES.

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ABSTRACT

PURPOSE OF STUDY: *To discuss clinical features, causes and outcome of acute dacryoadenitis.*
DESIGN: *Hospital based prospective study.*
DURATION: *From September 2001 to 31st December 2008.*
PLACE OF STUDY: *Department of Ophthalmology, Chandka Medical College Hospital Larkana.*
MATERIAL AND METHODS: *Our study included evaluation of 23 patients with acute dacryoadenitis resulting lacrimal gland and surrounding soft tissue inflammation of short duration. From eye out patient department all patients were admitted in the eye ward, where a specific proforma containing informed consent ,patient's bio data, history ,clinical examination ,investigations, treatment, and follow up was filled . The diagnosis of the disease was based on history, a compatible eye, general, systemic clinical examination and relevant investigations (where necessary) like eye discharge for Gram staining and culture, urethral discharge and culture and mono spot test. After evaluation, diagnosis and finding of underlying cause of the disease, the ocular treatment was advised by ophthalmologist and for systemic disease the patients were referred to general physician, dermatologist, paediatrician and urologist. In all patients, oral antibiotics, antiviral (where necessary), analgesics and topical antibiotic drops / ointment were given for 7 -10 days. Dosage depends upon the severity of the infection and age of the patient. The follow-up period was carried out at weekly, fortnightly and then monthly for 3 months. Only cases of acute dacryoadenitis were included in this study and cases with chronic dacryoadenitis and lacrimal gland tumour were excluded from this study.*
RESULTS: *Of these 23 cases with age range of 5 years to 18 years, 12 (52.17%) were male and 11 (47.82%) female .The disease was bilateral in 5 (21.73%) cases, on the left orbit 10 (43.47%) cases and on the right orbit 8(34.78%) cases. All the patients presented with sudden pain, redness and swelling in the superotemporal region of the orbit in association with clinical features of relevant underlying causative systemic disease like skin rashes on face and lids, fever, headache, malaise, upper respiratory tract infection (URTI),sore throat and ipsilateral preauricular, submandibular lymph adenopathy. The external eye examination showed red, tender, hot swelling of the lateral third of the upper lid (S-shaped lid), mucopurulent discharge with localized conunctival injection, chemosis. The causes of the disease seen were mumps 5(21.73%) cases, infectious mononucleosis 3(13.04%) cases, Herpes zoster ophthalmicus 3(13.04%) cases, staphylococcus aureus infection 3(13.04%) cases, hemophilus influenzae infection 3(13.04%). herpes simplex virus1 infection 2(8.69%) cases, streptococcus pyogenes infection 2(8.69%) cases, and gonorrhea 2(8.69%) cases. All patients were successfully treated with oral antibiotics, antiviral (where necessary), analgesics and topical antibiotic drops / ointment for 7-10 days. In the follow-up period of at least 3 months no any complication or recurrence of the disease was noticed.*
CONCLUSION: *Early presentation of patient, during initial stage of the disease will result in decreased risk of disease extension and ocular morbidity.*

KEY WORDS: Acute dacryoadenitis —— Viral infection, Analysis.

INTRODUCTION

The lacrimal gland is located in the superolateral aspect of the orbit, within the lacrimal fossa adjacent to the superior and lateral rectus muscle. It is roughly almond like in size and shape, extraconal in position and extends deep into the orbital septum. It consists

of the anterior and deeper orbital lobes, which are demarcated by the lateral horn of the aponeurosis of the levator palpebrae superioris.[1] The Lobe is visualized easily by upper lid eversion. This eccrine gland is responsible for the formation of the aqueous layer of the tear film which drain through canaliculi into the lacrimal sac and then into the nose beneath the interior turbinate. By definition, dacryoadenitis is an inflammatory enlargement of the lacrimal gland. It may be acute, sub acute and chronic with infectious or non infectious local or systemic etiology.[2] Acute dacryoadenitis is a rare disorder usually of infectious etiology. It is most common in children and young adults, even all ages can be affected. Routes of infection can be blood born, transconjunctival, transneuronal, or through direct inoculation from trauma. The most common causative agents are viruses including mumps, Epstein – Barr (mononucleosis), herpes simplex, herpes zoster, cytomegalovirus and rarely human immunodeficient virus. Bacterial dacryoadenitis is less common and often accompanies traumatic inoculation. Frequently recovered organisms include staphylococcus sp, streptococcus pyogenes sp, Neisseria gonorrhoeae, Haemophilus influenzae, and Moraxella catarrhalis .Non-infective inflammatory disorders such as sarcoidosis, Wagener granulomatosis and Crohn's disease are usually manifesting as chronic and /or bilateral dacryoadenitis, but must be ruled out. Rarely neoplastic etiologies including leukaemia and lymphoma may present as acute dacryoadenitis.[3] Clinically , the lesions of the lacrimal gland and fossa are found as palpable masses in the superolateral aspect of the orbit, and these lesions constitute about 5-13% of all of the orbital masses confirmed by biopsy.[4] Many different pathological entities arises from the lacrimal gland and fossa, and each of them requires a different clinical – pathological- therapeutic approach, and the radiological characterization.[5] Approximately half of the masses found in the lacrimal gland and fossa are epithelial tumours, of which half are pleomorphic adenomas and the rest are carcinomas. The remaining half of the masses includes lymphoid and inflammatory lesions, and it is possible to have a wide spectrum of diseases ranging from benign dacryoadenitis to malignant lymphomas. The other lesions seen are dermoid cysts, which arise from the epithelial rest of the lacrimal fossa, and intrinsic epithelial cysts, which are formed by dilation of the lacrimal duct. Pseudotumors are non-specific inflammatory mass lesions of the orbital tissues and they

PHOTOGRAPH.1



Photograph of 6 years old boy showing left eye acute dacryoadenitis caused by mumps.

PHOTOGRAPH.2



Photograph of 10 years old boy showing left eye acute dacryoadenitis caused by infectious mononucleosis.

PHOTOGRAPH.3



Photograph of 7years old boy showing left eye acute dacryoadenitis, bilateral preseptal cellulitis with left side herpes zoster ophthalmicus.

PHOTOGRAPH.4



Photograph of 14 years old girl showing right eye acute dacryoadenitis caused by herpes simplex virus infection with skin rashes on right forehead, cheek, and nose.

PHOTOGRAPH.5



Photograph of 8 years old boy showing right eye acute dacryoadenitis with boil of right upper lid and forehead caused by staphylococcus aureus infection.

PHOTOGRAPH.6



Photograph of 8 years old boy showing left eye acute dacryoadenitis caused by Haemophilus Influenzae infection.

PHOTOGRAPH.7



Photograph of 8 years old boy showing right eye acute dacryoadenitis with boil of right upper lid caused by streptococcal pyogenes infection.

PHOTOGRAPH.8



Photograph of 18years old male showing right eye acute dacryoadenitis caused by uretheral gonorrhea.

may also be found in the lacrimal gland region.[6] To find out underlying cause of the lacrimal gland disease, various laboratory and imaging investigations (where necessary) can be performed (see table 1). Computerized tomography (CT) and magnetic resonance imaging (MRI) are utilized to differentiate between different types of masses and to determine the extent of lesions involving the lacrimal gland and the fossa. Although many diseases that affect the lacrimal gland and fossa are specifically diagnosed by imaging, it is frequently very difficult to differentiate each specific disease on the basis of image characteristic alone due to intrinsic similarities, therefore careful clinical evaluation and moreover a histopathologic verification is needed.[1] The treatment of acute dacryoadenitis depends on the underlying cause, like antibacterial and antiviral therapy.

TABLE.1 SHOWING LIST OF INVESTIGATIONS REQUIRED FOR DIAGNOSIS OF LACRIMAL GLAND DISEASE.

NO	INVESTIGATION	INDICATION
1	Blood cell picture, erythrocyte sedimentation rate, total and differential leukocyte count, blood cell morphology	Acute/chronic-inflammation, leukaemia, and lymphoma.
2	Gram's staining and culture of purulent discharge of lids , conjunctiva	On Blood agar for bacteria, on Chocolate agar for Haemophilus sp ; Neisseria gonorrhoeae
	Blood culture and sensitivity	To identify bacteria
3	Immunoglobulin titters	For specific viruses e.g. Mumps, Epstein-bar, human immunodeficient (HIV),herpes simplex, herpes zoster etc
4	Venereal disease research labortary(VDRL), HIV , fluorescent traponema antibody absorbent(FTA-ABS),enzyme linked immunosorbent assay (ELISA)	For Venereal diseases
5	X-ray chest posteroanterior view(PAV) ,Mantoux test(MT), polymerase chain reaction(PCR)	For Tuberculosis
6	Sinus/chest x-ray, Rheumatoid arthritis (RA) factor, Anti-nuclear antibody (ANA),Antineutrophillic-cytoplasmic-antibody (ANCA) , C-reactive protein (CRP)	For Connective tissue disorders
7	X-rays chest PAV, serum angiotensin-converting-enzyme (S-ACE), and serum calcium level (S-Ca), 24-hours urine Ca level.	For Sarcoidosis
8	Hematocrit/hemoglobin,ESR, x-ray with barium ,abdominal CT scan	For Crohn's disease
9	C.T(Computed Tomography) scan orbit with contrast, and MRI (Magnetic Resonance Imaging)	To delineate extent of tissue involvement. (Indications-proptosis, restricted ocular movements, decreased vision).
10	Lacrimal gland biopsy	To rule out definite histopathological \ diagnosis

MATERIAL AND METHODS

Prospectively we studied 23 patients of acute dacryoadenitis aged between 5 to 18 years from September 2001 to date at department of ophthalmology ,chandka medical college hospital larkana .In each case , patients name ,age ,sex ,occupation ,address , detailed history, examination, and was noted on a specific proforma . The diagnosis of the disease was based on the clinical features of acute dacryoadenitis, of underlying systemic disease, the eye discharge Gram's staining and culture, urethral discharge and culture and mono spot test. After evaluation, diagnosis and finding of underlying cause of the disease, the ocular treatment was advised by ophthalmologist and for systemic disease the patients were referred to general physician, dermatologist, paediatrician and urologist. In all cases the oral antibiotics, antiviral (where necessary), analgesics and topical eye antibiotics drops / ointment were given for 7-10 days. The follow-up period was carried out at weekly, fortnightly and then monthly for 3 months .Only cases of acute dacryoadenitis were included in this study and cases with chronic dacryoadenitis and lacrimal gland tumour were excluded from this study.

RESULTS

Of these 23 cases with age range of 5 to 18 years, 12 (52.17%) were male and11 (47.82%) female. The disease was bilateral in 5(21.73%) cases, on the left orbit 10 (43.47%) cases and on the right orbit 8 (34.78%) cases (see table 2, 3). All patients presented with sudden pain, redness and swelling in the superotemporal region of the orbit in association with clinical features of relevant disease (see table 4, 5). The external eye examination showed red, tender, hot swelling of the lateral third of the upper lid (S-shaped lid), and mucopurulent discharge with localized conunctival injection, and chemosis. On evertion of lid, the involved palpebral lobe of lacrimal gland was enlarged and on palpation through lid it was firm, hot and tender. The causes of the disease seen were mumps 5(21.73%) cases, infectious mononucleosis 3(13.04%) cases, Herpes zoster ophthalmicus(HZO) 3(13.04) cases, staphylococcus aureus infection 3(13.04%) cases, hemophilus influenzae infection 3(13.04%)cases, herpes simplex virus1 infection 2(8.69%)cases, streptococcus pyogenes infection 2(8.69%) cases, and gonorrhea 2(8.69%) cases .The relevant treatment was given after diagnosis of underlying systemic cause of the disease. (see table 4,5). In the follow-up period of at least 3 months no any complication or recurrence of the disease was noticed.

DISCUSSION

We have seen about 560 cases of various types of orbital diseases from September 2001 to date, of which 41(7.32%) cases of lacrimal gland disease of any cause were picked up. The break-up of above lacrimal gland diseases was pleomorphic adenoma 5 (12.19%) cases, lymphoma 2(4.87%) cases, leukaemia 2 (4.87%) cases, adenocarcinoma

3 (7.31%) cases, chronic dacryoadenitis 6 (14.63%) cases and acute dacryoadenitis23 (56.09%) cases. Fitzsimmons TD et al [7] and Mafee MF, et al [8] reported in their studies that acute dacryoadenitis mostly occur in children, and on unilateral side with no sexual predilection. Similarly in our study most of patients were children 16(69.56%) cases, and on unilateral side 18(78. 26%) cases with male: female ratio of 1.03: 1.0. Rhem M N et al [9] noticed in their study, that both viral and bacterial infection increases the risk of acute dacryoadenitis equally, but we have seen this more in viral infections 13(56.52%) cases. In each case, as the diagnosis of acute dacryoadenitis and underlying systemic disease was usually apparent from their clinical features, therefore we have not performed all laboratory and imaging investigations in our cases.

We have seen 5 cases of mumps with acute dacryoadenitis in our study, and two of them had history of studying in the same class, which indicates transmission of disease either by direct contact or by droplet infection. Therefore to prevent the outbreak of the disease, all the children above 12 months of age should be immunised by MMR (measles, mumps and rubella) vaccine [10] (see photograph of patient 1).In our study three cases of infectious mononucleosis presented by classical triad of fatigue, pharyngitis, and generalised lymphadenopathy especially of epitrochlear, cervical, and submandibular lymph nodes. In these cases risk factors seen were prolonged use of oral corticosteroids in bronchial asthma, and bacterial meningitis. These types of diseases should be properly diagnosed and managed with judicious use of steroids, such as use of steroid inhalers instead of systemic steroids in bronchial asthma and short course of steroids in bacterial meningitis. Also avoid irrational use of antibiotics like ampicillin ,amoxicillin to prevent "ampicillin rash "[11] (see photograph of patient 2). We have seen 3 cases of HZO with clinical features of skin rashes on ipsilateral side in dermatomal distribution, preseptal cellulitis, pain, fever, headache, and malaise. In two patients history of varicella (chickenpox) during infancy was positive. The risk factors of infection seen were severe malnutrition, prolonged corticosteroid therapy for nephrotic syndrome and immunosuppressive therapy for acute myeloid leukaemia. VZV transmission is difficult to prevent, because the infection is contagious for 24 to 48 hours before the rash appears .Infection can be easily prevented by isolation and vaccination. The live virus vaccine is recommended for routine administration in children from 12-18 months of age .Older children, adolescents, and adults without history of VZV infection should also be immunized. Varicella-zoster immunoglobulin (VZIG) postexposure prophylaxis is recommended for immunocompromised children. [12] (see photograph of patient 3). Two patients, one with primary and another with recurrent infection of HSV TYPE I were seen with ipsilateral skin rashes of eye lids, forehead, cheek, and conjunctivitis. The risk factors noticed in these patients were recurrent fever, emotional stress, prolonged exposure to ultraviolet light and menstruation .Acyclovir administered before a known trigger factor, such as intense sunlight usually prevents recurrences. There is active research to develop a vaccine to prevent HSV infection. [13] (see photograph of patient 4). We have seen three cases of acute dacryoadenitis associated with ipsilateral staphylococcal aureus infection of skin of forehead, upper eye lid, and conjunctiva. In these patients, risk factors noticed were ipsilateral traumatic abscess of forehead, upper eye lid abscess, and suppurative conjunctivitis. Staphylococcal infection is transmitted primarily by direct contact. Strict attention to hand washing

TABLE 2 SHOWING CAUSES, NUMBER OF PATIENTS, SEX, AGE RANGE, LATERALITY, OF PATIENTS WITH VIRAL ACUTE DACRYOADENITIS. (N =13)

No	Cause	No of Patients	Male	Female	Age range	Laterality
01	Mumps parotitis	5	3	2	6y-9y	Bil:3 Rt:1 Lt: 1
02	Infectious mononucleosis	3	1	2	7y-18y	Bil:2 Lt:1
03	Herpes zoster ophthalmicus infection	3	2	1	6y-18y	Rt:1 Lt:2
04	Herpes simplex virus 1 infection	2	1	1	8y-14y	Rt:1 Lt 1
	Total	**13**	**7**	**6**	6-18	BIL:5 Rt:3 Lt:5

KEY: y= years, RT= right, Lt=left, Bil= bilateral

TABLE 3 SHOWING CAUSES, NUMBER OF PATIENTS, SEX, AGE RANGE, LATERALITY, OF PATIENTS WITH BACTERIAL ACUTE DACRYOADENITIS. (N =10)

No	Cause	No of Patients	Male	Female	Age range	Laterality
01	Staphylococcus aureus infection	3	1	2	7y-14 y	Rt :2 Lt: 1
02	Haemophilus influenzae infection	3	1	2	5y-11y	Rt:1 Lt:2
03	Gonorrhea	2	2	-	17y-18y	Rt:1 Lt:1
04	streptococcus pyogenes infection	2	1	1	6y-13y	Rt:1 Lt:1
	TOTAL	**10**	**5**	**5**	**5y-18y**	**Rt: = 5** **Lt = 5**

KEY: y= years, Rt= right, Lt=light

TABLE 4 SHOWING, CAUSES, PRESENTATION, CLINICAL EXAMINATION, INVESTIGATIONS AND TREATMENT OF PATIENTS WITH VIRAL ACUTE DACRYOADENITIS. (N = 13)

S No:	No. of Patients	Cause	Presentation	Clinical Examination	investigations	Treatment
1	5	Mumps parotitis	* Fever, headache, malaise, pain in neck & parotid region.	**hot, tender enlargement of parotid and submandibular glands.	Clinical diagnosis	Oral amoxicillin clavulanate 25-50 mg/kg/ day, ibuprofen 15-20 mg/ kg/ day in divided doses ,and topical 0.3% ciprofloxacin eye drops, ointment for 7-10 days
2	3	Infectious mononucleosis	* Fever, headache, malaise fatigueness, sore throat , nausea myalgia	** Pharyngitis, epitrochlear, cervicaland submandibular lymphadenopathy	Heterophile antibody test , atypical lymphocytosis (mono spot test)	*** Oral acyclovir 15-20 mg/kg / dose 5 times a day for 7 days and corticosteroids 1mg/kg/dayfor 15 days in tapered dose
3	3	Herpes zoster ophthalmicus infection	* Fever, headache, malaise, pruritis and painfull skin rashes on half of fore head, eyelids and face.	** Vesicular skin rashes on half of fore head, eyelids and face in dermatomal distribution	Clinical diagnosis	*** Oral acyclovir 15-20 mg/kg / dose 5 times a day for 7 days
4	2	Herpes simplex virus 1 infection	*Fever, headache, malaise, and pain full skin rashes on eye lids, cheek.	** Vesicular skin rashes on eye lids, check	Clinical diagnosis	***Oral Acyclovir 15-20 mg/kg / dose 5 times a day for 7 days

*. Sudden pain, redness and swelling in the superotemporal region of the orbit.
**Red, firm, hot and tender swelling of lateral third of the upper eye lid and palpebral lobe of lacrimal gland with outer conjuctival chemosis, injection and mucopurulent discharge.
***Oral amoxicillin clavulanate 25-50 mg/kg/ day, ibuprofen 15-20 mg/kg/ day, topical 0.3% ciprofloxacin eye drops, and ointment in divided doses for 7-10 days

techniques is the most effective measure for preventing the spread of staphylococci from one individual to another. Use of a detergent containing an iodophor, chlorhexidine, or hexachlorophene is recommended. [14] (see photograph of patient 5). In three patients, the acute dacryoadenitis was caused by H. influenzae .The risk factors identified were otitis media, sinusitis, and bronchitis individually. Universal immunization with H. influenzae type b conjugate vaccine is recommended for all infants. Chemoprophylaxis (rifampin orally 20 mg /kg/dose for 4 days) is indicated if close contacts are unvaccinated [15]. (see photograph of patient 6). In our study there were two cases of streptococcus pyogenes induced acute dacryoadenitis associated with stye of the upper eye lid, preseptal cellulitis, tonsillitis and pharyngitis. The risk factors seen were eyelid and fore-head skin wound caused by blunt trauma and insect bite. The only specific indication for long term use of antibiotics to prevent streptococcal infections is for patients with a history of acute rheumatic fever or rheumatic heart disease .Because the ability of antimicrobial agents to prevent streptococcal infection is limited, a streptococcal vaccine offers the possibility of more effective approach.[16] (see photograph of patient 7). We have seen two men with genitourinary gonorrhea. Both of them were unmarried and had history of homosexuality with multiple sexual partners. In the absence of vaccine, prevention of gonorrhea can be achieved through education, use of barrier contraceptives (especially condoms), intensive epidemiologic and bacteriologic surveillance (screening sexual contacts), and early identification and treatment of infected contacts [17]. (see photograph of patient 8). Although acute dacryoadenitis is a rare disease, but when untreated it may leads to significant ocular soft tissue morbidity like lacrimal gland abscess, preseptal cellulitis, orbital cellulitis, orbital abscess, lid ptosis and adhesions. Infection involving the superficial tissue layers anterior to the orbital septum is termed preseptal cellulitis. Uncomplicated preseptal cellulitis does not imply a risk for visual impairment or direct central nervous system extension. Preseptal cellulitis is characterized by fever, edema, tenderness, warmth of the lid and, occasionally purple discolouration. Evidence of interruption of the integument is usually absent. Infections of the orbit are infrequent and usually complicate ethamoid and sphenoid sinusitis. Orbital cellulitis may present with lid oedema but is distinguished by the presence of proptosis, chemosis, impaired vision, limitations of the extra ocular movements, and decreased mobility of the globe or pain on movement of the globe. The distinction between preseptal and orbital cellulitis may be difficult. The extent of the infection is best delineated by computerized tomography (CT). Orbital infections are treated with parenteral therapy for at least 14 days. Underlying sinusitis or orbital abscess may require surgical drainage and more prolonged antimicrobial therapy [15].

CONCLUSION

Infectious disease remain one of the major cause for acute dacryoadenitis .Therefore early presentation of patient during initial stage of the disease , immediate diagnosis, successful treatment and gentle care of viral and bacterial infections will reduce the risk of lacrimal gland infection extension and ocular morbidity.

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TABLE 5 SHOWING, CAUSES, PRESENTATION, CLINICAL EXAMINATION, INVESTIGATIONS AND TREATMENT OF PATIENTS WITH BACTERIAL ACUTE DACRYOADENITIS. (N = 10)

S No:	No. of Patients	Cause	Presentation	Clinical Examination	investigations	Treatment
	3	Haemophilus infection	influenzae discharge from ear,flue,and cough individually	** otitis media, sinusitis,and bronchitis individually.	Conjunctival discharge for Gram staining , and culture	***Oral amoxicillin/clavulanate-25-50 mg /kg/ day, ibuprofen 15-20mg/kg/day, in divided doses for 7-10 days
	3	Staphylococcus aureus infection	*Fever,headace, malaise, swelling with pain on fore head, upper eye lid,and pusy discharge from eye individually	**red,hot,firm, tender swelling on right side of fore head, upper eye lid stye,and suppurative conjunctivitis individually.	Conjunctival discharge for Gram staining , and culture	***Oral dicloxacillin 50-100mg/kg/ day in divided doses for 7-10days.
	2	Gonorrhea	* Purulent uretheral discharge , dysurea, and penile edema	** Swelling of glans penis with thick yellowish-greenish urethral discharge	Uretheral discharge for Gram staining , and culture	***Intravenous injection Ceftriaxone 1gm state.
	2	Streptococcus pyogenes infection	* Fever, headache, malaise,cough, sore throat.	** stye with preseptal celullitis, tonsillitis , pharyngitis individually.	Conjunctival discharge for Gram staining, and culture	***Erythromycin estolate 20-40mg/kg/day in divided doses for 7-10 days.

*. Sudden pain, redness and swelling in the superotemporal region of the orbit.
**Red, firm, hot and tender swelling of lateral third of the upper eye lid and palpebral lobe of lacrimal gland with outer conjuctival chemosis, injection and mucopurulent discharge.
***Oral ibuprofen 15-20 mg/kg/ day, topical 0.3% ciprofloxacin eye drops and ointment in divided doses for 7-10 days.

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