

ORIGINAL RESEARCH

Assessing The Clinical Profile And Treatment Outcome Of Various Children With Epiphora

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ABSTRACT

Introduction: Epiphora is the overflowing of tears in the presence of normal tear production that could be due to obstruction in the lacrimal drainage apparatus. Immediate resolution might occur in most of the cases within one year of life. The objective of this study is to assess the clinical profile and treatment outcome of various children with epiphora.

Materials and Methodology: A total of 215 eyes of 175 patients (50 bilateral cases) aged less than 11 years. Demographic data such as age, gender, laterality and clinical history of the patients were recorder after getting details from the parents or attendants. Chi-square and Fisher's exact test were used to test the difference in the two proportions was done using SPSS (version 11) (SPSS Inc., Chicago, USA) $P < 0.05$ was denoted a statistically significant difference.

Results: A total of 175 patients were studied. The mean age of onset of symptoms was 1.6 ± 2 years (range, 1 month–8 years) and the mean age of presentation was 2.8 ± 2.5 years (range, 2 months–9 years). Ninety-six patients (55%) had an early onset (<3 years) and 79 patients (45%) had a late-onset epiphora (≥ 3 years). The male: female ratio in the early-onset group was 1.5:1, and in the late-onset group, it was 3.3:1, with an overall ratio of 1.9:1. Overall, 131 cases (75%) were unilateral (64% in early-onset group and 88% in late-onset group).

Conclusion: Increasing age invariably decreases the success rate of sac massage and probing. The factors that are predictive of treatment failure other than age are laterality, increasing symptom severity, presence of infection, and previous history of treatment.

Keywords: CNLDO, epiphora, lacrimal apparatus blockage, congenital, acquired

INTRODUCTION

Lacrimation is due to the reflex of over-production of tears by stimulating the trigeminal nerve either by irritation of the cornea or conjunctiva¹ whereas epiphora is defined as the overproduction/overflow of tears in the presence of normal tear production caused by either obstruction in the lacrimal drainage apparatus, i.e., puncta, canaliculi, sac or nasolacrimal duct or improper tear drainage.^{2,3} In children the most important aetiology of epiphora is congenital nasolacrimal duct obstruction (NLDO) which occurs in 20%–30% of the newborn. The other reasons for epiphora after trauma, surgery, inflammation which leads to NLDO

(Nasolacrimal Duct Obstruction), canalicular obstruction or punctal stenosis and malposition of the glands. There are numerous studies which demonstrated the efficacy of probing in congenital NLDO in children up to 3–4 years of age.^{4,5} There are no studies till date which aimed at evaluating the clinical profile and success rates of sac massage, probing and DCR. The other objective of this study is to find out the difference in demographic and clinical characteristics between the early onset (2 years) epiphora.

Immediate resolution might occur in most of the cases within one year of life.⁶ There are various treatment modalities that can be employed to revert the congenital nasolacrimal duct obstruction (CNLDO) that majorly include sac massage, probing, probing along with intubation. Balloon catheterization, silicon tube intubation and external dacryocystorhinostomy (DCR). Young age individuals that include children less than one year are typically managed with digital sac massage. And this procedure has reported to be having a high success rate that is claimed till 76-95%.⁷ Other procedure like nasolacrimal duct probing has to be tried after the first year of life and it has claimed to have a success rate of 77-97% after the fresh application.⁸ DCR is usually employed in an individual where CNLDO is diagnosed as a result of craniofacial anomalies, down's syndrome, children with failed sac massage and probing. There are no studies till date which aimed at evaluating the clinical profile and success rates of sac massage, probing and DCR. The objective of this study is to assess the clinical profile and treatment outcome of various children with epiphora.

MATERIALS AND METHODOLOGY

This study is a prospective observational study which was conducted in patients with complaints of watering eyes reported to the Department. A total of 215 eyes of 175 patients (50 bilateral cases) aged less than 11 years. After obtaining informed consent from either parents or guardians and getting approval from Chintpurni Medical College Pathankot.

The diagnosis of epiphora was based on the presence of any one of the following features such as history of tearing and discharge for >4 weeks, presence of lacus lacrimalis, raised tear meniscus height, presence of discharge, and positive regurgitation test. Patients with hyperlacrimation or pseudoepiphora and those not willing for follow-up were excluded from the study. Demographic data such as age, gender, laterality and clinical history of the patients were recorded after getting details from the parents or attendants. In detail of the presenting symptoms and signs, culture and sensitivity reports of conjunctival and its associated craniofacial and ocular anomalies. The treatment given and in case of any other additional investigations such as computed tomography (CT)- dacryocystography (DCG) when advised by the treating clinician were noted.

Descriptive statistics were used for demographic characteristics and the data presented in percentages, mean, and standard deviation. Chi-square and Fisher's exact test were used to test the difference in the two proportions was done using SPSS (version 11) (SPSS Inc., Chicago, USA) $P < 0.05$ was denoted a statistically significant difference.

RESULTS

A total of 175 patients were studied. The mean age of onset of symptoms was 1.6 ± 2 years (range, 1 month–8 years) and the mean age of presentation was 2.8 ± 2.5 years (range, 2 months–9 years). Ninety-six patients (55%) had an early onset (<3 years) and 79 patients (45%) had a late-onset epiphora (≥ 3 years). The male: female ratio in the early-onset group was 1.5:1, and in the late-onset group, it was 3.3:1, with an overall ratio of 1.9:1. Overall, 131 cases (75%) were unilateral (64% in early-onset group and 88% in late-onset group). Congenital NLDO was the most common aetiology of paediatric epiphora seen in 76% (133/175) of the cases, followed by trauma (iatrogenic and non-iatrogenic) seen in 18%

(31/175). The other causes included – acquired NLDO in 4% (7/175) and punctal causes in 2% (3/175) cases. Table 1 describes the various types of traumatic and punctal cases that had been reported in the study population. The commonest symptoms in all groups including early and late onset was discharge (68%), watering (22%), itching (8%) and pain with swelling (2%). We had also selected children with complaints of watering and who were associated with craniofacial and ocular anomalies. These ocular and systemic anomalies have been briefed in table-2. Different types of treatment modalities utilized include sac massage in all 214 eyes, (100%), sac massage and probing in 22 eyes (10%) and sac massage, probing and DCR in 11 eyes (5%). Skin grafting was done along with DCR in a case of cicatricial NLD block after thermal injury. The treatment method given was based on the age of presentation as shown in Table-3

Table – 1: Distribution of cases with injury

TYPE OF INJURY	n
Road traffic accident	5
Fall from height	2
Gulli danda injury	1
Cricket ball injury	1
Post-surgical after major facial surgery	1
Cicatricial post thermal injury	1

Table – 2: Distribution of ocular, systemic and craniofacial anomalies associated with epiphora

CRANIOFACIAL ANOMALIES	n
Down's syndrome	3
Craniosynostosis	1
Apert syndrome	2
Mild cranial anomalies	1
Total	7
OCULAR ANOMALIES	
Telecanthus	7
Epiblepharon	2
Iridofundal coloboma	1
Lid coloboma	1
Total	11

Table – 3: Treatment results based on laterality, symptom severity and previous treatment history

PARAMETERS	SUCCESS	FAILURE
LATERALITY (p=0.05)		
Unilateral	110	15
Bilateral	32	12
SYMPTOM SEVERITY (p=0.029)		
Watering	67	8
Discharge	108	34
PREVIOUS TREATMENT HISTORY (p=0.027)		
Present	110	35
Absent	64	8

DISCUSSION

It has been observed in our study that congenital NLDO was reported to be the commonest cause in followed by NLDO due to post traumatic condition. Almost around 99% cases that had been reported below 1 year were due to congenital NLDO. Whereas in the late onset cases both congenital and acquired conditions were almost equally prevalent. And the commonest cause of trauma was due to road traffic accident which resulted in medial canthus and injuries to the sac area. These were mostly avulsion injuries that were typically associated with a triad of telecanthus, epiphora and ptosis as also reported by *Priel et al.*⁹ The critical factor to be taken into consideration is the location of the site of obstruction before the onset of treatment in traumatic cases. CT –DCG is observed to be a useful diagnostic tool in clinically challenging cases of traumatic epiphora. It helps in the following ways like in order to find out the level of obstruction, to locate whether the obstruction is complete or incomplete, intrinsic or extrinsic to the duct and to find out the cause of obstruction.¹⁰ CT-DCG was done mostly in post-traumatic cases and presented that the commonest site of obstruction was sac-NLDO junction. There was higher symptom severity in late onset group with 77% cases presenting discharge, 19% with watering and 4% eyes with lacrimal sac area swelling. This may be explained by the prolonged inflammation that could possibly lead to greater symptoms and signs. The results of probing with or without silicon intubation reported to have success rates as briefed in other studies range from 55% to 96%.¹¹⁻¹³ The success rate of probing in our study was observed to be 82 %. This lowered rate may be due to inclusion of few complicated cases such as previously failed cases and cases that are associated with craniofacial anomalies. A comparatively lower success rate of probing alone (77%) in our study could be attributed to several reasons. First, the inclusion of cases with a complex form of obstruction like previously failed treatment and syndromic patients with associated craniofacial and ocular anomalies which were mostly excluded in most of the other studies is the key reason. Moreover, a comparison of the treatment outcome of probing in cases undergoing a first trial of probing with the cases who had a previous history of ≥ 1 failed probing revealed that the success rate was significantly lower in the latter group (90% vs. 57%). Secondly, various additional procedures such as inferior turbinate fractures repair, etc., were not done during probing in our study. In this study it has been analysed that the impact of several clinical factors on the clinical outcome and found a statistically significant association between treatment outcome and laterality ($P = 0.05$), symptom severity ($P = 0.029$) and previous treatment history ($P = 0.027$). *Honavar et al* reported the factors predictive of failure of probing such as age >36 months, bilateral affection, failed conservative therapy, failed earlier probing, dilated lacrimal sac, and firm obstruction.¹⁴ *Mannor et al* found a significant association between success of probing with age and symptom severity but not with a previous treatment history¹⁵ while *Kashkouli et al* found no association with laterality or presence of infection.¹⁶ *Repka et al* found an association with laterality and symptom severity.¹⁷

CONCLUSION

In case of congenital NLDO, sac massage is a key treatment modality in children up to 1 year of age and probing remains an effective treatment approach in children up to 3 years of age. Increasing age invariably decreases the success rate of sac massage and probing. The factors that are predictive of treatment failure other than age are laterality, increasing symptom severity, presence of infection, and previous history of treatment.

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