Effect of Early Medical Management of Congenital Nasolacrimal Duct Obstruction

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Abstract: Congenital nasolacrimal duct obstruction (CNLDO) is a common disorder in infants, with up to 20% of all newborns suffering from epiphora during the first year of life. This study was done to evaluate the effect of early medical management of CNLDO on the rate of resolution. CNLDO was diagnosed in 87 infants between 2012 and 2014 in pediatric clinic, Aziziah Maternity and Children Hospital, Jeddah, kingdom of Saudi Arabia. All were treated with massage plus topical antibiotics (when indicated). The age of the infants ranged from one to six months and the obstruction was resolved in 83 patients, 75% of them within the first three months and the rest within eight months of initiation of medical management, the overall success rate was 95.4% **Conclusion**: CNLDO should be managed with an initial conservative treatment, started as early as possible and continued for up to the age of one year. If the blockage is not cleared at this age, the patient must be referred to ophthalmologist for probing.
[Hala Atta Youssef. **Effect of Early Medical Management of Congenital Nasolacrimal Duct Obstruction.** *Nat Sci* 2015;13(6):150-153]. (ISSN: 1545-0740). http://www.sciencepub.net/nature. 20

Key words: Nasolacrimal duct obstruction – Medical management.

1. Introduction:

Obstruction of the nasolacrimal duct is the most common abnormality of the infant's lacrimal apparatus encountered by pediatricians and ophthalmogists, with up to 20% of all newborns suffering from epiphora during the first year of life (1,2). Although, it is generally agreed that the canalization of the lower end of the nasolacrimal duct is completed by the eighth or ninth month of intrauterine life, some authors have suggested that this happens just before birth (3). An imperforate membrane at the distal end (nasal orifice) of the nasolacrimal duct is the usual cause of occlusion (4).

The infant with a nasolacrimal duct obstruction usually presents within the first few weeks of life with the complaints of persistent tearing (epiphora) and crusting on the eye lashes (5). The diagnosis of CNLDO can also be confirmed by gently pressing over the nasolacrimal sac and observing mucopurulent material refluxing from either punctum. If this obstruction is not cleared, fibrosis of the duct, mucocele, pericystitis, fistula or even orbital cellulitis can occur (6).

The incidence of CNLDO is the subject of conflict, reported as 1.75-6%, 5-15% or 20% by different authors (2, 7, 8).

There is much controversy regarding the proper management of CNLDO. Pediatricians advise waiting until it is evident that the problem will not spontaneously resolve before recommending a nasolacrimal probing (9). While Schnall (10) recommended early probing of the nasolacrimal system after several weeks of topical antibiotics therapy. The decision to probe early in the office or continue medical management and probe beyond a year of age in a facility with a general anesthetic is at the discretion of the ophthalmogist (11).

The purpose of this study was to evaluate the effect of early medical management of CNLDO (massage and when indicated topical antibiotics) on the rate of resolution.

2. Patients and Methods:

Eighty seven cases with CNLDO were evaluated in this study between 2012 and 2014 in Pediatric Clinic, Aziziah Maternity and Children Hospital, Jeddah, kingdom of Saudi Arabia. Patients were presented with epiphora, non inflamed conjunctiva, recurrent mucopurulent discharge and an otherwise normal ocular examination.

We entered into the study to determine the effect of early medical management. These patients were collected sequentially from the practice of the author in the pediatric clinic during the routine visits of the infants for follow up and vaccinations after delivery. Infants with acute dacrocystitis, congenital mucocele of the nasolacrimal sac, history of trauma or multiple congenital anomalies were excluded from the study.

Parents of the children were instructed to massage the nasolacrimal system in a manner similar to that described by Crigler (12).

The technique was demonstrated by the author to the parents and consisted of placing the index finger over the common canaliculus to block the exit of material through the puncta and stroking down wards firmly to increase the hydrostatic pressure within the nasolacrimal sac in attempt to rupture the membranous obstruction. The author observed the parents while they were performing the massage technique. The parents were instructed to perform this

maneuver for about 15-20 strokes per day. Antibiotic eye drops was prescribed to be used four times a day when a mucopurulent discharge was present.

All infants were treated with this protocol until the signs and symptoms of CNLDO resolved or infant reached twelve months of age. After twelve months of age a probing of nasolacrimal system was arbitrarily advised.

Infants were followed monthly during the routine visits for vaccinations and the parents, usually the mother, were asked about the exact time of resolution of the symptoms. The results were analyzed statistically with SPSS statistical program using student "t" test.

3. Results:

Of the 87 infants in the study, 50 were males (57.5%) and 37 were females (42.5%), this sex difference did not differ significantly (P>0.1). Ages at initial examination ranged from 1-6 months, the median age was 2.1 months and about 75% of them were diagnosed in the first two months of life.

Twenty seven infants had bilateral involvement (31.1%) while in 25 only the right eye was affected (28.7%) and in 35 only the left eye was affected (40.2%). This difference was insignificant (P>0.05). In almost all instances of bilateral involvements, resolution in one eye was within one week up to one month of resolution in the other.

The nasolacrimal duct obstruction had totally resolved in 83 out of 87 infants. Resolution was not achieved in only 4 patients with this regimen till the age of one year, where they were referred to ophthalmologist for probing which was done successfully in all 4 patients. The median time to resolution was 10.89 weeks from instituting medical management and almost 75% of the patients achieved successful resolution within 12 weeks of non surgical management. The overall success rate was 95.4%. Cumulative percentages of successful resolution by weeks of treatment are presented in Fig. (1).

Data relating months of required treatment to age at presentation, showed no significant relationship. The 4 infants in whom resolution did not occur till the age of one year, the median age at presentation were 4.5 months. Also, there was no significant difference between resolution time of right, left or bilateral eye affection (P=0.612), Fig (2). On the other hand our data showed that females required more time for resolution than males which was found to be significant (P = 0.025), Fig. (3).

Typically the improvement of symptoms and signs occurred within one or two weeks of instituting treatment, usually the time of complete resolution of symptoms and signs could be pinpointed to a particular week. Parents became aware that their infant had no further evidence of epiphora or mucopurulent discharge.

Even if some of the parents did not massage or performed it incorrectly, still 95.4% of CNLDO resolved without the trauma, cost and risk of surgery.

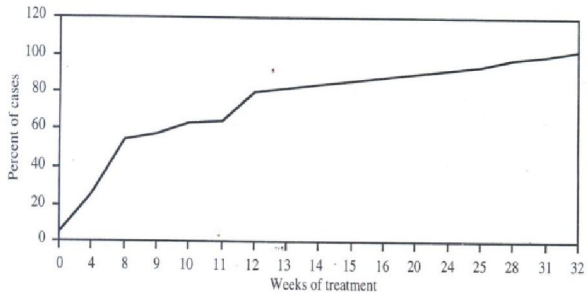

Fig. (1): Cumulative percent of cases resolved with medical treatment by weeks of treatment.

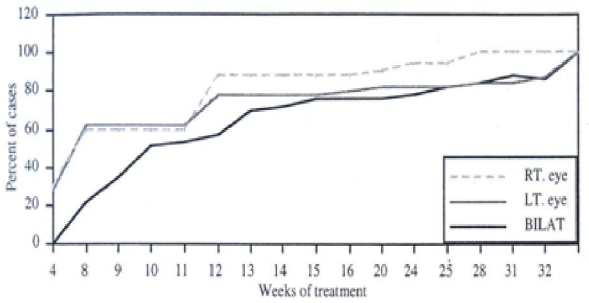

Fig. (2): Correlation between bilaterality and resolution time (P=0.612).

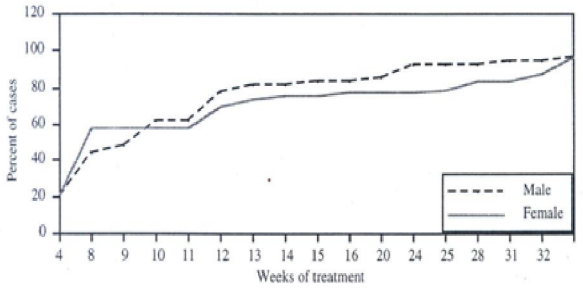

Fig. (3): Correlation between sex and resolution time (p=0.025).

4. Discussion:

This study represents the effect of early massage plus topical antibiotics for treatment of infants with CNLDO. The age of the patients on presentation was different from that of other studies as all our patients were diagnosed and started treatment in the first six months of life, median age at presentation was 2.13 months.

Controversy continues to exist about when to probe the nasolacrimal ducts of infants with CNLDO. **Kakizaki et al. (13)** studied thirty-five lacrimal ducts

in 27 patients diagnosed with CNLDO.Twenty-nine lacrimal ducts in 21 patients resolved during the 1st year of age (82.9%), with 16 lacrimal ducts resolved before six months of age.

Ciftci et al. (14) studied three hundred and fifty eyes with CNLDO,conservative management was applied in children less than one year of age and was successful in 91.8% (0-6 months) and 60% (7-12 months), the difference between these two success rates was significant (P=0.003).

Lorena et al. (15), in their study, found 32 out of 200 premature infant (16%) and 7 out of 200 full term infants (3.5%) had CNLDO. Also 35 of them underwent conservative treatment.

There has been concern by some ophthalmologists that the longer the delay beyond 2 to 4 months after birth, the poorer the results of probing nasolacrimal duct obstructions become (16). In our series of 87 consecutive infants with CNLDO, 83 obstructions resolved by eight month of medical management. Many of the patients were spared a surgical procedure that probably would have been performed if earlier probing had been advocated. Almost 75% of nasolacrimal duct obstruction resolved by three months of non invasive treatment.

Schellini et al. (17) found that 64% of their survey participants indicated that they use massage as the initial treatment until 1 year of age and lacrimal probing (70.8%) for patients > 1 year of age. Early probing used by 58.3% of the patients for a dilated lacrimal sac, and 66.7% reported that lacrimal system probing in conjunction with irrigation is effective. Hayashi et al. (18) found that spontaneous resolving rate was 51% at 12 months and 78% at 18 months of age while 11% were treated with late probing after 18 months and all were cured.

Many ophthalmologists stated that if a nasolacrimal duct obstruction does not resolve by 7 or 8 months of age, probing can still be performed in the office. After the age of 8 months, the possibility increases that the probing may need to be performed under general anesthesia (19). Although I accept that infants under 8 months of age can be probed successfully without general anesthesia, yet nearly all of these infants would have resolved with medical management alone.

Our data showed that female infants need more time for resolution than male infants which was found to be significant, this could be attributed to parents' compliance, because some parents give more care with regular massage for males more than females.

5. Conclusion:

Based on the results of our study, I recommend that all infants with uncomplicated CNLDO must be diagnosed early by pediatricians and treated with digital massage as described earlier in this study plus topical antibiotics if any mucopurulent discharge is present. Most obstructions will resolve by 12 months of life and not require probing of the nasolacrimal system. If the blockage is not cleared at this age, the patients must be referred to ophthalmologist for probing and this delay will not affect the results of probing.

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6/21/2015