DOI: https://doi.org/10.53350/pjmhs020231712212

ORIGINAL ARTICLE

Non-Surgical Treatment Success Rate for Nasolacrimal Duct Obstruction in Children up to Two Years of Age

MUHAMMAD AMIN[1], MUHAMMAD AFZAL KHAN[2], ABDUL BARI[3], CHAKAR TAJWIDI[4], NESR FAROOQ[5], MEHTAB MENGAL[6]
[1]*Assistant Professor, Department of Ophthalmology, Teaching Hospital, Loralai*
[2]*Associate Professor, Department of Ophthalmology, Bolan University of Medical & Health Sciences, Quetta*
[3]*Senior Registrar, Consultant Eye Surgeon, Sandeman Provincial Hospital, Quetta*
[4]*Assistatn Professor, Department of Ophthalmology, Mekran Medical College Turbat Kech*
[5]*Assistant Professor, Department of Ophthalmology, Shalamar Medical & Dental College, Lahore*
[6]*Assistant Professor, Department of Ophthalmology, Bolan Medical College/HEH Quetta*
Correspondence to: Dr. Muhammad Amin, E-mail: drkakar1980@yahoo.com Cell: 0333-7803766

ABSTRACT

Background: Congenital nasolacrimal duct obstruction (CNLDO) is a common condition where the nasolacrimal duct, which drains tears from the eye into the nasal cavity, is blocked at birth.

Objective: To assess the non surgical treatment success rate for nasolacrimal duct obstruction in children up to two years of age**.**

Study Design: Prospective interventional study

Place and Duration of Study: Department of Ophthalmology, Teaching Hospital, Loralai from 1st February 2023 to 31st July 2023.

Methodology: Fifty babies (54 eyes) under two years of age were enrolled. The children included were clinically diagnosed for persistent congenital nasolacrimal duct obstruction. The children were divided into four groups according to their age. Groups A to D were categorized as infants <6 months, between 6-12 months (older infants), between 12-18 months (toddlers) and between 18-24 months (older toddlers) respectively. The clinical symptoms including discharge history from one eye or both eyes, crusting, lid stickiness, mucopurulent discharge and redness were documented. All children were given non-surgical managing treatment comprising of Hydrostatic-Nasolacrimal Sac-Massage once a week through a well-trained clinician. In addition, topical antibiotic drops were prescribed to be applied whenever the mucopurulent discharge was presented. The regime was continued for six months and was discontinued only if the condition was treated.

Results: The mean age of the children enrolled was 6.2±3.4 months. The clinical symptoms of children included 62% having mucopurulent discharge, 32% having epiphora, 4% mucocele and 2% having lacrimal abscess. The number of successful cases reported in children below 6 months was highest with a percentage of 81.81%. This was followed by children within the age group of 6-12 months having 81.25% success rate of non-surgical management of congenital nasolacrimal duct obstruction. The success rate declined with an increase in age with only 60% successful cases observed in children of 18-24 months. The non-surgical treatment success rate was analyzed as 77.77% (~78%) for nasolacrimal duct obstruction in children up to two years of age.

Conclusion: There were 77.77% of children who were successfully treated through non-surgical treatment success for nasolacrimal duct obstruction up to two years of age.

Keywords: Non-surgical treatment, Success rate, Nasolacrimal duct obstruction.

INTRODUCTION

Congenital nasolacrimal duct obstruction (CNLDO) is among the most frequently observed congenital conditions in pediatric ophthalmology, affecting approximately 20-30% of newborns, though reported prevalence ranges from 6% to 84%.[1-4] This condition arises due to blockage at the Hasner membrane valve. Despite its relatively high occurrence, clinical symptoms appear in only 2-6% of affected infants. Additionally, in nearly 90% of cases, the obstruction resolves naturally within the first year of life.[5,6]

Several factors may contribute to the development of CNLDO, including maternal infections during pregnancy, certain medications, radiation exposure, occupational hazards, and genetic susceptibility.[7,8] Epiphora is a condition where there is an abnormal tear flow resulted due to overproduction of tears or sue to obstruction in the lacrimal drainage system.[9]

Epiphora in majority of cases leads to CNLDO wherein the canalization failure of distal duct end is the main reason.[10] Commonly canalization failure appears at the end of six months of child's birth, however it can show delays by several weeks and even months. There are several factors and anomalies of nasal passage which can cause nasolacrimal duct obstruction which can even be presented in 30% of full-term children.[11]

There are surgical and non-surgical methods applied for treating and managing congenital nasolacrimal duct obstruction. Various studies over the globe have presented data for non-surgical approaches for avoiding surgical procedures and complications related to it. However, it is very important to know the success rate of such applications. The present study was designed to evaluate the success rate of non-surgical management strategies for treating congenital nasolacrimal duct obstruction within children below two years of age. The results of this study led to significant contribution in providing authentic data about success rates of non-surgical methods, consequently providing better health outcomes for young children.

Received on 19-08-2023
Accepted on 05-11-2023

MATERIALS AND METHODS

This prospective interventional study was performed at Department of Ophthalmology, Teaching Hospital, Loralai from 1st February 2023 to 31st July 2023 on 50 babies (54 eyes) under two years of age. The children were included after their parental signing on informed written consent while the study was ethically approved before initiation. The children included were clinically diagnosed for persistent congenital nasolacrimal Duct Obstruction. The sample size was generated by considering 95% confidence of interval 80% power of test and 5% margin of error. The prevalence of congenital nasolacrimal duct obstruction was taken as 20-30% within all neonates born. The inclusion criteria comprised of uni or bilateral congenital nasolacrimal duct obstruction babies with failed conservative treatment, unresolved congenital dacryoceyle cases and children <2 years with copious mucopurulent discharge. The children with acute dacryocystitis or having blepharitis, conjunctivitis, or congenital glaucoma were excluded. In addition to this those children having ocular defects including ectopic puncta, punctal-stenosis, congenital ectropion and agenesis as well as any other congenital abnormalities of craniofacial as Goldenhar's syndrome, Crouzon's syndrome or Treacher-Collins were also excluded from the study. Children having clinical history of

nasolacrimal duct surgery or radiation exposure were also not included in the study. The children were divided into four groups according to their age. Groups A to D were categorized as infants < 6 months, between 6-12 months (older infants), between 12-18 months (toddlers) and between 18-24 months (older toddlers) respectively. The clinical symptoms including discharge history from one eye or both eyes, crusting, lid stickiness, mucopurulent discharge and redness were documented. A well-structured questionnaire was designed to enter all the relevant information. All children were given non-surgical managing treatment comprising of Hydrostatic-Nasolacrimal Sac-Massage once a week through a well-trained clinician. The exact treatment method included blocking of upper and lower puncta with trimmed nails, washed hands using thumb and the index-finger of one hand and messaging with other hands index finger with collection of fluid into the sac and pressured downward towards NLD to open the blocked NLD. Parents were further instructed for conducting similar messaged four times daily with ten stroked per message. In addition, topical antibiotic drops were prescribed to be applied whenever the mucopurulent discharge was presented. The regime was continued for six months and was discontinued only if the condition was treated. Data was entered into SPSS-25 and statistically interpreted using Chi square test. P value <0.05 was considered as significant.

RESULTS

The mean age of the children was 6.2±3.4 months and majority 38% of the children belonged to the group A followed by group B having 32% of children (Table 1). Within the present study children there were 26% children born preterm with 22% through Lower (uterine) segment caesarean section (LCSC) and 4% through normal vaginal delivery (NVD). There were 74% children born full term with 44% born through NVD (Table 2). The clinical symptoms of children included 62% having mucopurulent discharge, 32% having epiphora, 4% mucocele and 2% having lacrimal abscess (Fig 1).

The number of successful cases reported in children below 6 months was highest with a percentage of 81.81%. This was followed by children within age group of 6-12 months having 81.25% success rate of non-surgical management of congenital nasolacrimal duct obstruction. The success rate declined with an increase in age with only 60% successful cases observed in children of 18-24 months (Table 3). The non-surgical treatment success rate was analyzed as 77.77% (~78%) for nasolacrimal duct obstruction in children up to two years of age. The cases which failed in getting treated were around 22% with majority of children within the toddler age group (Fig. 2).

Table 1: Distribution of children within the groups

Group	Age (months)	Girls	Boys	No. of Children	No. of Eyes
A	< 6	13 (26%)	6 (12%)	19 (38%)	22 (40.74%)
B	6-12	9 (18%)	7 (14%)	16 (32%)	16 (29.63%)
C	12-18	6 (12%)	5 (10%)	11 (22%)	11 (20.37%)
D	18-24	2 (4%)	2 (4%)	4 (08%)	5 (9.26%)
Total	-	30 (60%)	20 (40%)	50 (100%)	54 (100%)

Table 2: The mode of delivery of enrolled children

Term	Mode of Delivery	No. of Children (%)
Pre-term	Lower (uterine) segment caesarean section	11 (22%)
	Normal vaginal delivery	2 (04%)
Full-term	Lower (uterine) segment caesarean section	15 (30%)
	Normal vaginal delivery	22 (44%)

Table 3: The comparative successful and unsuccessful cases details in accordance with number of eyes of enrolled children

Group	Age (months)	No. of Eyes	Successful	Unsuccessful
A	< 6	22	18	4
B	6-12	16	13	3
C	12-18	11	8	3
D	18-24	5	3	2
Total		54	42	12

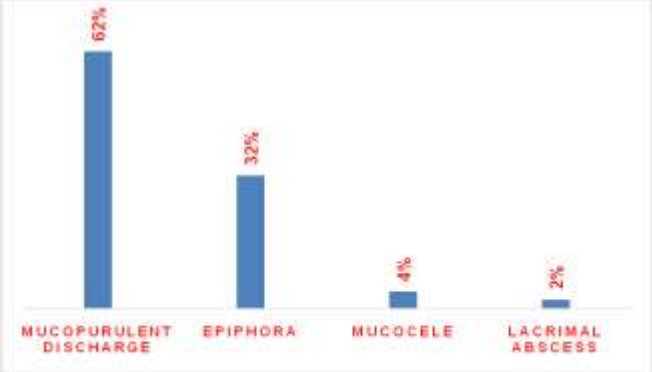

Fig. 1: Clinical symptoms of children with nasolacrimal duct obstruction

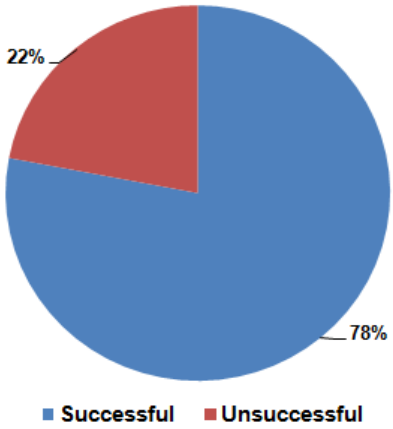

Fig. 2: The non-surgical treatment success rate for nasolacrimal duct obstruction in children up to two years of age

DISCUSSION

The current study aimed to evaluate the effectiveness of non-surgical treatment, specifically Hydrostatic Lacrimal Sac Massage, in infants under two years old diagnosed with congenital nasolacrimal duct obstruction (CNLDO). The results indicated that this method, combined with topical antibiotics, was most effective in infants aged 6 to 12 months. After six months of conservative treatment, parents reported symptom resolution in 42 eyes (77.77%). Previous research has shown similar success rates for non-surgical management of CNLDO.[12-15]

This prospective study on infants up to six months old found that 70% of cases (26 out of 37) resolved by the time the child reached 12 months. One of the strengths of this study was its prospective design with a standardized follow-up period. Parents were specifically trained to perform the massage at home, and weekly sessions were conducted by a clinician.[16-18]

The excessive tearing and discharge appeared around two weeks of age in approximately 20% of infants, a finding consistent with the present study, where majority of the cases showed symptoms after four weeks. Additionally, inflammation of the lacrimal sac within the first week of life can cause epiphora and reflex tearing, mimicking CNLDO. The similar results have been reported in this study and elsewhere.[19,20]

CONCLUSION

There were 77.77% of children who were successfully treated through non-surgical treatment success for nasolacrimal duct obstruction up to two years of age.

REFERENCES

1. Britto FC, Rosier VV, Luz TV, Verde RC, Lima CM, Lessa MM. Nasolacrimal duct mucocele: case report and literature review. Int Arch Otorhinolaryngol 2015;19:96-8.
2. Gujar SK, Gandhi D. Congenital malformations of the orbit. Neuroimaging Clin N Am 2011; 21:585-602.
3. Ramkumar VA, Agarkar S, Mukherjee B. Nasolacrimal duct obstruction: does it really increase the risk of amblyopia in children? Indian J Ophthalmol 2016;64:496-9.
4. Leonard DS, O'Keefe M, Rowley H, Hughes JP. Neonatal respiratory distress secondary to bilateral intranasal dacryocystocoeles. Int J Pediatr Otorhinolaryngol 2008;72:1873-7.
5. Lorena SH, Silva JA, Scarpi MJ. Congenital nasolacrimal duct obstruction in premature children. J Pediatr Ophthalmol Strabismus 2013;50:239-44.
6. Bagheri A, Safapoor S, Yazdani S, Yaseri M. Refractive state in children with unilateral congenital nasolacrimal duct obstruction. J Ophthalmic Vis Res 2012;7:310-15.
7. Kim JW, Lee H, Chang M, Park M, Lee TS, Baek S. Amblyopia risk factors in infants with congenital nasolacrimal duct obstruction. J Craniofac Surg 2013;24:1123-5.
8. Aldahash FD, Al-Mubarak MF, Alenizi SH, Al-Faky YH. Risk factors for developing congenital nasolacrimal duct obstruction. Saudi J Ophthalmol 2014;28:58-60.
9. Karti O, Karahan E, Acan D, Kusbeci T. The natural process of congenital nasolacrimal duct obstruction and effect of lacrimal sac massage. Int J Clin Ophthalmol Visual Sci 2016; 36(6): 845-9.
10. Ali MJ, Kamal S, Gupta A, Ali MH, Naik MN. Simple vs complex congenital nasolacrimal duct obstructions: etiology, management and outcomes. Int Forum Allergy Rhinol 2015;5:174-7.
11. Darraj A, Barakat W, Kenani M, et al. Common eye diseases in children in Saudi Arabia (Jazan). Ophthalmol Eye Dis 2016;8:33-9.
12. Verma S, Dhabarde A, Verma R, Kumar S. Effectiveness of non-surgical management of congenital nasolacrimal duct obstruction, Int J Adv Res 2024;13(01), 885-92.
13. Lin AE, Chang YC, Lin MY, Tam KW, Shen YD. Comparison of treatment for congenital nasolacrimal duct obstruction: a systematic review and meta-analysis. Can J Ophthalmol 2016;51:34-40.
14. Weiss AH, Baran F, Kelly J. Congenital nasolacrimal duct obstruction: delineation of anatomic abnormalities with 3-dimensional reconstruction. Arch Ophthalmol 2012;130:842-8.
15. Schellini SA, Ariki CT, Sousa RL, Weil D, Padovani CR. Management of congenital nasolacrimal duct obstruction - Latin American study. Ophthalmic Plast Reconstr Surg 2013;29:389-92.
16. Abdu L, Bawahab N, Mohammed Hussain RW, Qary H, Saeedi A, Alhibshi N. Prevalence and Treatment Outcome of Nasolacrimal Duct Obstruction in Saudi Children with Down Syndrome. Cureus 2020;;12(1):e6672.
17. Yoo Y, Yang HK, Kim N, Choung HK, Hwang JM, Khwarg SI. Amblyopia risk factors in congenital nasolacrimal duct obstruction: a longitudinal case-control study. PLoS One 2019;14(6):e0217802.
18. Siddiqui SN, Mansoor H, Asif M, Wakeel U, Saleem AA. Comparison of anisometropia and refractive status in children with unilateral and bilateral congenital nasolacrimal duct obstruction. J Pediatr Ophthalmol Strabismus 2016;53(3):168-72.
19. Sasaki T, Matsumura N, Miyazaki C, Kamao T, Yokoi N, Fujimoto M, et al. Congenital nasolacrimal duct obstruction: Clinical Guideline Preparation Team; Committee for Congenital Nasolacrimal Duct Obstruction Clinical Guideline. Congenital nasolacrimal duct obstruction: clinical guideline. Jpn J Ophthalmol 2024;68:367-88.
20. Fayet B, Racy E, Bordonné C, Katowitz WR, Katowitz J, Brémond-Gignac D. Complex bony congenital nasolacrimal duct obstruction caused by an adjacent canine tooth bud. Ophthalmic Plast Reconstr Surg 2019;35(1):e23-e24.

This article may be cited as: Amin M, Khan MA, Bari A, Tajwidi C, Farooq N, Mengal M: Non-Surgical Treatment Success Rate for Nasolacrimal Duct Obstruction in Children up to Two Years of Age. Pak J Med Health Sci, 2023; 17(12): 212-214.