ORIGINAL ARTICLE

Congenital nasolacrimal duct obstruction: caesarean section vs. vaginal delivery

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ABSTRACT

Aim To investigate the association between the incidence of congenital nasolacrimal duct obstruction (CNDO) and delivery by caesarean section or spontaneous vaginal labour.

Methods A total of 40 patients who were diagnosed as CNDO and treated with lacrimal probing between January 2011 and February 2013 were reviewed retrospectively. The patients were divided into two groups: group 1 (caesarean section delivery) and group 2 (spontaneous vaginal delivery).

Results A total of 22 patients delivered by caesarean section (group 1) were compared with 18 patients delivered by spontaneous vaginal labour. There were 10 male (45%), 12 female (55%) patients in group 1 and nine (50 %) males, nine females (50 %) patients in group 2. The mean age of group 1 was 14.85 months (12-22 month) and group 2 was 15.20 months (12-23 month). Mean birth time was 38.1 week (36-40 week) in group 1 and 39.4 week (38-41 week) in group 2. There was no statistically significant difference between the age, gender and birth time between the groups ($p>0.05$). There was no statistically significant difference between the way of delivery (caesarean section or spontaneous vaginal delivery) and the incidence of CNDO ($p>0.05$).

Conclusion Congenital nasolacrimal duct obstruction was found less frequently among the patients delivered by vaginal delivery comparing to the patients with caesarean delivery, however this difference was not statistically significant. It is considered that, with the studies which include more patients, the difference may become significant.

Key words: epiphora, probing, nasolacrimal duct obstruction, congenital

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INTRODUCTION

Congenital nasolacrimal duct obstruction (CNDO) is a frequently seen condition, with prevalence between 1.8% and 20% in newborns (1). Congenital nasolacrimal duct is generally blocked with a thin mucosa membrane (Hasner's valve) in inferior meatus. It is thought that congenital CNDO occurs as a result of a canalization fault in columnar epithelial cells that form duct (2-4). The patients usually come with epiphora, mucous discharge accumulated at the side of eyelashes, and conjunctivitis, as well as occasional redness and swelling in lacrimal sac area related to acute dacryocystitis attacks in the first month after the birth. Until 12 months, approximately 85% of the patients recover from epiphora without any treatment (5). In some studies, it is reported that it may delay up to 24 months to open completely (3,4). For the cases that do not recover without treatment in the first few months, massage to lacrimal sac and antibiotic drops may be useful (1,3). In cases where such treatments are ineffective, probing, bicanalicular silicone intubation, and dacryocystorhinostomy are the other treatment methods (4,5). In these cases, the aim of probing is to reach distal end of nasolacrimal duct and to pierce the membrane that cause blockage (4,5). There is no common opinion about the timing of probing for CNDO. The specialists who advocate for probing in the first year claim that late probing increases the risk of infection and causing a scar in canalicular system and reduces the success of subsequent probings (6).

At our clinic, we try to open blockage of the patients with CNDO diagnosis between 12th to 24th months after birth using probing according to their date of diagnosis. In our study, patients who were diagnosed with CNDO and then applied probing at our clinic were reviewed retrospectively no matter if they were born with Caesarean section or vaginal delivery. We aimed to know the impact of physiologic changes that happen during vaginal delivery on nasolacrimal duct, thus to Hasner's valve.

The aim of this study was to investigate the impact of the delivery methods (vaginal or caesarean) on CNDO.

PATIENTS AND METHODS

Patients and study design

All patients attended to Ophthalmology Clinic of Şanlıurfa Balıklıgöl State Hospital with CNDO symptoms and clinical findings, and those who were treated with lacrimal probing between January 2011 and February 2013 were included in the study. The patients' records were reviewed retrospectively. Patients under 12 months of age were treated with lacrimal massage and antibiotic therapy. Probing was applied under general anaesthesia in patients who were unresponsive to massage and antibiotic therapy. The patients were divided into two groups according to the delivery way: group 1 (caesarean section delivery) and group 2 (spontaneous vaginal delivery).

Methods

Disappearance of fluorescein test was applied to suspicious cases. One drop of fluorescein solution (2%) was placed into conjunctival sac of both eyes. Even after five minutes, uncleaned paint in tear pool was evaluated in favour of obstruction. Before probing, medical and surgical history of patients was questioned and full ophthalmologic examination was conducted. All the cases were examined at our ear nose throat service, to check the presence of any pathology in nasal cavity and inferior meatus region before the operation. Probing was applied after the treatment in cases with other pathologies (rhinorrhoea and tonsillitis). Probing was applied to the patients older than one year of age. Th operation was conducted under general anaesthesia (inhalation anaesthesia) and in surgery room conditions.

Technically, a probe was pushed forward from superior punctal dilatation to ampulla vertically, then turned to horizontal plan 90 degree, and to avoid a lap in canalicul, superior lid was pulled toward lateral. The probe was pushed forward until lacrimal sac wall (until reaching a bone). At this stage, the probe was pulled back and directed to down 90 degree and pushed forward until membrane rupture was sensed. After probing, lavage was done with diluted antiseptic solution (povidone iodine). Passage clarity was checked by oxygen catheter placed in inferior meatus with sucking antiseptic solution. For the cases with obstruction in both channels, probing was applied to both eyes in the same session.

Postoperatively, for one week tobramycin eye drop and fluorometholone drop were applied five times a day, and for 3 days, respectively, nasal decongestant spray three times. During the follow-up, the families were asked if there was

still any lacrimation or not. Ophthalmologic examination and disappearance of fluorescein test were done. Probing was accepted as successful only for the cases with no lacrimation and examinations without epiphora and normal paint disappearance during of fluorescein test. For the cases with obstruction after the first probing, it was repeated after two months. The cases with obstruction after the second probing were tracked to apply bicanalicular tube intubation and dacryocystorhinostomy.

Statistical analysis

Data entry and statistical evaluation were done using $\chi 2$ test in order to compare the effect of caesarean section and vaginal delivery on CNDO patients. Statistical significance was set up at $p<0.05$.

RESULTS

The records of 40 probing patients with CNDO who were operated between Jan 2011 and Feb 2013 were analysed retrospectively. The patients born with caesareans delivery were in first group while the ones with vaginal delivery were in the second. The number of patients in the first group was 22 (55%) and 18 (45%) in the second one. There was no statistically significant difference between the way of delivery (caesarean section or spontaneous vaginal delivery) ($p=0.52$) . There were 10 male (45%) and 12 female (55%) patients in group 1, and nine (50 %) male and nine female (50 %) patients in group 2. The mean age of group 1 was 14.85 months (12-22 month) and group 2 it was 15.20 months (12-23 month). There were also no statistically significant differences between the age and gender of the groups ($p>0.05$). The average age of probing varied between 12-18 month and 12-20 month, and the average probing age was 13.75 month and 14.50 month, in the group 1 and 2, respectively ($p>0.05$). The effect of two different delivery methods on CNDO showed a small difference between two groups with no significant difference ($p>0.05$).

DISCUSSION

There are many studies related to the treatment methods of the CNDO, (7-13) but there is a limited number of studies on the etiopathogenesis of the disease (14,15). No evidence was found about any relation between obstruction and sex predilection, age of the mother, x-ray exposure and drug intake during pregnancy, geographical and environmental features, smoking status and education of the parents (10). Aldanash et al. found that infection during pregnancy is a statistically significant risk factor, but they did not indicate a specific infection (11). However some studies have found genetic predisposition among CNDO patients, but there are different opinions about inheritance of the disease. Aldanash et al. found an association between CNDO and family history documented higher rate among first degree siblings (11). Also, Yie et al. suggested sporadic or multifactorial mode of inheritance (12). On the other hand, Barham et al. argued the inheritance of CNDO (13).

In 2015, Zhang et al. reported that there was an enlargement of bony nasolacrimal duct (14). They showed that in patients who have unilateral CNDO transversal - vertical diameters and areas of bony nasolacrimal duct on the affected side increased significantly compared with those on the unaffected side by CT scans. The bony lacrimal duct is soft in childhood. Therefore, when the nasolacrimal duct is obstructed, pressure increase causes enlargement of the bony nasolacrimal duct on the affected side. This situation is caused by continuous increase in hydrostatic pressure within the lacrimal duct. Hydrostatic pressure in the nasolacrimal duct increases with age and this may play a positive role in self-healing of patients by age (15).

In this study, we were curious about physiological effects of increased external pressure on opening the valve of Hasner during vaginal delivery. For that reason we compared the two delivery methods (caesarean and vaginal delivery) among patients who had probing applied and found minor difference between the two groups (no statistically significant difference). We were not able to compare our results because there were no similar studies. We believe that further studies with larger patient population may give different results.

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TRANSPARENCY DECLARATION

Conflicts of interest: None to declare.

REFERENCES

1. MacEwen CJ, Young JD. Epiphora during the first year of life. Eye (Lond) 1991:596-600.
2. Tucker NA, Tucker SM, Linberg JV. The anatomy of the canaliculus. Arch Ophtalmol. 1996; 114:1231-4.
3. Ipek E, Esin K, Amac K, Mustafa G, Candan A. Morphological and evaluation of lacrimal groove. Anat Sci Int 2007; 82:207-10.
4. Katowitz JA, Kropp TA. Congenital abnormalities of the lacrimal drainage system. In: Hornblass A, ed. Oculoplastic, Orbital and Reconstructive Surgery. Baltimore: Williamsand Wilkins, 1990: 1397-416.
5. Maceven CJ. Congenital nasolacrimal duct obstruction. Compr Ophtalmol Update 2006; 7:79-87.
6. Takahashi Y, Kakizaki H, Chan WO, Selva D. Management of congenital nasolacrimal duct obstruction. Acta Ophtalmol 2010; 88:506-13.
7. Zwaan J. Treatment of congenital nasolacrimal duct obstruction before and after the age of 1 year. Ophtalmol Surg Lasers 1997; 28:932-6.
8. Ciftci F, Akman A, Sonmez M, Unal M, Güngör A, Yaylali V. Systematic, combined treatment approach to nasolacrimal duct obstruction in different age groups. Eur J Ophtalmol 2000; 10:324-9.
9. MacEven CJ, Young JD. The fluorescein disappearance test: an evaluation of its use in infants. J Pediatr Ophthalmol and Strabismus 1991; 28:302-5.
10. Noda S, Hayasaka S, Setogawa T. Congenital nasolacrimal duct obstruction in Japanese infants: its incidence and treatment with massage. J Pediatr Ophthalmol Strabismus 1991; 28:20–2.
11. 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.
12. Yie YF. The inheritance of congenital nasolacrimal duct stenosis. Zhonghua Yan Ke Za Zhi 1989; 25:349–50.
13. Barham HP, Wudel JM, Enzenauer RW, Chan KH. Congenital nasolacrimal duct cyst/dacryocystocele: an argument for a genetic basis. Allergy Rhinol (Providence) 2012; 3:e46–9.
14. Zhang C,Wu Q, Cui Y and Yu G. Anatomy of nasolacrimal canal in congenital nasolacrimal duct obstruction – 18 cases retrospective study. Acta Ophthalmol 2015; 93:e404.
15. Moscato EE, Kelly JP, Weiss A. Developmental anatomy of the nasolacrimal duct: implications for congenital obstruction. Ophthalmology 2010; 117: 2430–34.