Prevalence of Nasal Septal Deviation in New-borns and Its Precipitating Factors: A Cross-Sectional Study

Anil S. Harugop · R. S. Mudhol · P. S. Hajare ·
A. I. Nargund · V. V. Metgudmath ·
S. Chakrabarti

Received: 13 February 2010 / Accepted: 13 June 2010 / Published online: 13 May 2011
© Association of Otolaryngologists of India 2011

Abstract To estimate the prevalence of neonatal nasal septal deviation and to identify the precipitating factors. 250 neonates were examined on the 2nd day using Gray's struts for the presence of deviated nasal septum. Struts passing up to the 4 cm mark was taken to be normal, while struts getting stuck before the 4 cm mark was diagnosed to have deviated septum on that particular side. Out of 250 neonates, 49 had nasal septal deviation. There was significantly higher number of deviations in neonates of primiparas, emergency LSCS and in high birth weight babies. Neonatal septal deviation is quite common, being present in approximately 20% of all newborns. Greater amount of birth trauma increases its incidence further.

Keywords Deviated nasal septum · Neonatal nasal septal deviation · Deviated nasal septum in new-borns · Struts · Strut test

Introduction

Deviated nasal septum is a very common condition, such that deviated septum is a rule rather than exception. It causes considerable amount of morbidity among ENT patients. One of the most common etiological factors for development of deviated nasal septum is nasal injury in the intra-uterine life and during the process of parturition [1].

The nose being the most projecting part of the face is not surprisingly, subjected to tremendous amount of compressional and rotational forces in the intrauterine life and during

the process of parturition. Hence nasal septal deformity (NSD) in neonates is not uncommon.

There are 2 types of NSD in newborns. (a) Anterior dislocation- where the septal cartilage is dislocated from the maxillary groove and it shows an external deformity of the nose. (b) Secondly combined septal deformity, which occurs due to transmitted forces on the foetal skull during moulding and may not show an external deformity [1].

A significant number of newborns have deviated nasal septum and the incidence is mentioned to be from 2.9 to 31% in various studies [2, 3].

Infants as we know are obligatory nasal breathers, thus nasal obstruction leads to cyanotic spells, high pulmonary resistance and can even lead to respiratory failure. Traumatic subluxation of the nose causing acute respiratory distress and cyanosis in newborns have been reported in the literature [4]. Besides this, nasal obstruction commonly leads to poor feeding and colic due to aerophagy and infected nose. Deviated nasal septum that persists predisposes to sinusitis, epistaxis, Eustachian tube dysfunction, otitis media, upper and lower respiratory tract infections, dental malalignments and poor general health.

Many of these deformities do persist in adult life and gives rise to physiological, anatomical, psychological and cosmetic complications.

The present study is done to understand the importance of strut test in diagnosis of deviated nasal septum in newborn babies.

Materials and Methods

Source of Data

New-borns aged 2 days, admitted in the department of OBG, Paediatrics or ENT wards of KLE's Prabhakar Kore

A. S. Harugop (✉) · R. S. Mudhol · P. S. Hajare ·
A. I. Nargund · V. V. Metgudmath · S. Chakrabarti
Department of ENT & HNS, KLESH & MRC and JNMC,
Belgaum 590010, Karnataka, India
e-mail: aharugop@yahoo.com

hospital were included. Subjects were chosen by simple random sampling, using a random number table. Two days old newborns were selected because tissue oedema in the first day of life may give a high false positive result, and many newborns are discharged from the hospital after 2 days following uncomplicated delivery.

Exclusion Criteria

Newborns having cleft lip, cleft palate, cleft nose, other malformations of head and neck region and with major life threatening illnesses were excluded from the study.

Study Design, Sample Size and Methodology

The study design is a cross-sectional study, and a sample size of 250 cases collected from 1st January 2009 to 31st August 2009, were included in the study. Institutional ethical clearance was obtained prior to initiation of the study.

After obtaining informed consent, history was obtained and ENT examination was done, along with the strut test, according to a pre-fixed proforma. History included history of nasal discharge, noisy breathing, poor feeding and any birth trauma. Examination of nose was done to rule out external deviation, a cold spatula test and cotton wool test were done, and anterior rhinoscopy was performed using otoscope.

Strut Test

It is the main diagnostic examination. It was done using acrylic strips measuring 2 mm thick, 4 mm wide, and 10 cm long with a mark at 4 cm from one end. These struts were passed into the nasal cavity, hugging the septum. If

Fig. 1 Struts have passed till the 4 cm mark on both sides, indicating straight septum

Fig. 2 Struts have passed till the 4 cm mark on left side, but is stuck before the 4 cm mark on the right side, indicating deviated septum to the right

the strut passed till the 4 cm mark, then there is no deviation on that side of the nasal cavity (Fig. 1), whereas if the strut gets stuck before the 4 cm mark then there is a septal deviation on the same side (Fig. 2).

Statistical Analysis

Chi square test was used to calculate statistical significance for the results obtained. Medcalc 8.2 statistical software was used for analysis.

Results

Out of total of 250 cases, 118 were females and 132 were male babies. Out of them 49 were found to have DNS, 26 were females and 23 were males. 23 cases had DNS to left, 25 had DNS to right and 1 had bilateral deviation of the septum.

In this study, 33 out of 49 NSD cases were new-borns born to primipara and only 16 were new-born born to multipara mother (Table 1). The total number of primiparas in the study was 126, thus 26.19% of new-borns born to primipara had NSD, and only 12.9% of new-borns born

Table 1 Sex distribution of the subjects and the DNS cases and the distribution of primipara or multipara in both groups

	Males	Females	Primipara	Multipara
Total number	132	118	126	124
Number of NSD	23	26	33	16
Percentage	17.42	22.03	26.19	12.90

P-value < 0.05

Table 2 Distribution of the subjects and the DNS cases with regard to the various modes of delivery

	Normal vaginal delivery	Emergency LSCS	Elective LSCS	Instrumental delivery
Total number	124	79	30	17
No. of DNS	13	24	00	12
Percentage	10.48	30.37	00	70.59

P-value < 0.001

Table 3 Distribution of the subjects and the DNS cases with regard to birth weight of the neonate

	Low birth wt. (<2.5 kg)	Normal birth wt. (2.5–3 kg)	High birth wt. (>3 kg)
Total number	49	138	63
No. of DNS	05	16	28
Percentage	10.20	11.59	44.44

P-value < 0.001

to multipara had NSD. This was statistically significant with a *P* value < 0.05 (Table 1).

The other important fact brought out in our study is the relationship of Neonatal Septal Deviation (NSD) with the mode of delivery. The mode of delivery suggests the amount of birth trauma. It is least in elective caesarean section, average in vaginal deliveries and maximum in difficult deliveries, like emergency caesarean section, persistent occipito posterior, vacuum deliveries, forceps, etc. The incidence of NSD is shown to increase proportionally with the increase in the amount of birth trauma, i.e., least incidence is seen in newborns of elective section, and highest in instrumental deliveries and this difference was statistically significant with a *P* value of <0.001 (Table 2).

In our study we also found that the babies with higher birth weight had higher incidence of NSD than normal or low birth weight babies. Statistical significance was calculated for the high birth weight group versus normal and low birth weight group combined, as well as separately. Both times *P* value was <0.001 suggesting the result to be statistically significant (Table 3).

Discussion

The incidence of NSD in newborns is a matter of considerable debate and various studies have shown the incidence varying from 0.6 to 31%, and no general consensus has

developed yet. On the other hand, an important aspect to determine the incidence would be to use the correct method for a precise diagnosis of NSD in newborns. Nasal struts, as popularised by Lindsay Gray, is nowadays considered a standard tool in diagnosis of NSD in newborns. Struts are simple instruments, easy to use, needs minimal skill, is fairly accurate and non-invasive [1].

The incidence varies considerably with the amount of birth trauma, and higher the birth trauma, higher is the incidence of NSD [3, 5]. This information would help us to pinpoint the risk group, who are most likely to have NSD at birth. The risk groups would be neonates of primiparas, prolonged and difficult labours and cephalo-pelvic disproportion (as in high birth weight babies) as brought out in this study.

In the study by Lindsay Gray, a follow-up of the neonates with NSD for up to 2 years and more showed that 95% of the deviations persisted and 80% of the straight septum, at birth, were still straight. Further studies have provided controversial reports on this subject, but in general a septal dislocation is unlikely to reduce on its own [1].

In the same study by Gray, reduction of the septal dislocation has been mentioned, done by Grays modified Walshams forceps, and the procedure is simple, well tolerated by the newborns when done early and gives a permanent result. This has been approved by others like Jeppensen et al. and Kent et al. [1, 6].

Tasca et al., in 2004 has presented a series of 49 cases that underwent septal manipulation within 48 h after birth and were re-examined 10–17 years later (mean 13.2 years) and found satisfactory results in all except 3 who had irreplaceable septum at birth. The septal dislocation persisted for the 3 cases, but not in the rest [7].

Hence the overall scenario is as follows. The incidence of neonatal NSD is around 20% and is more common in neonates with higher birth trauma. Significant number of NSDs persists till adult life and gives rise to DNS in adults. Also, reduction of NSD is simple, easy, and long-lasting, especially when done within 3 days of life, giving permanent relief from the morbidity.

Conclusion

Neonatal septal deviation is quite common, being present in approximately 20% of all newborns. Greater amount of birth trauma, like in primiparas, instrumental deliveries or emergency LSCS, and high birth weight predisposes more to neonatal septal deviation and increases the incidence.

Strut test being a simple, non-invasive, and fairly accurate is quite useful for diagnosis of Neonatal septal deviations. The test can be carried out by a trained nurse or ANMs at the peripheral centres and positive NSD cases can be referred for proper management.

References

1. Gray LP (1978) Deviated nasal septum. Incidence and etiology. *Ann Otol Rhinol Laryngol* 87:3–20
2. Kent SE, Reid AP, Nairn ER, Brain DJ (1988) Neonatal septal deviations. *J R Soc Med* 81:132–135
3. Chintapatla S, Kudva YC, Nayar RC, Raghuveer TS, Prasad D (1989) Septal deviations in neonates. *Indian Paediatr* 26:678–682
4. Luers JC, Welzing L, Roth B, Streppel M (2009) Traumatic luxation of nose in a newborn, case report and review of literature. *Eur Arch Otorhinolaryngol* 266(9):1489–1493
5. Abhinandan B, Uddin S, Purkaystha P (2005) Deviated nasal septum in the newborn—a 1-year study. *Indian J Otolaryngol* 57(4):304–308
6. Jeppensen S, Windfeld I (1972) Dislocation of nasal septal cartilage in the newborn. *Acta Obstet Gynec Scand* 1(51):5–15
7. Tasca I (2004) Compadretti G C. Immediate correction of nasal septum dislocation in newborns: long term results. *Am J Rhinol* 18(1):47–51