International Journal of Contemporary Pediatrics
Ambey R et al. Int J Contemp Pediatr. 2018 Jul;5(4):1222-1225
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: http://dx.doi.org/10.18203/2349-3291.ijcp20182012

Original Research Article

Mode of gavage feeding: does it really matters

Ravi Ambey[1], Priya Gogia[2]*, Kalpesh Manager[3]

[1]Department of Pediatrics, Gajra Raja Medical College, Gwalior, Madhya Pradesh, India
[2]Department of Pediatrics, Government Medical College, Vidisha, Madhya Pradesh, India
[3]Department of Pediatrics, Gandhi Medical College, Bhopal, Madhya Pradesh, India

Received: 21 April 2018
Accepted: 30 April 2018

***Correspondence:**
Dr. Priya Gogia,
E-mail: gogiapriya09@gmail.com

ABSTRACT

Background: The establishment of safe oral feeding in preterm or low birth weight infants may be delayed because of poor co-ordination of sucking and swallowing, neurological immaturity and respiratory distress. Enteral feeds may be delivered through a catheter (feeding tube) passed via the nose or via the mouth. This study was planned to compare oro-gastric and naso-gastric route for placing feeding tube to see duration to achieve full feeding.
Methods: The study was conducted in in-patient of SCNU (Sick Newborn Care Unit) of Department of Paediatrics. All patients (200 newborns) in the study were randomly enrolled in groups as per gestational weeks between 28-34 weeks by using New Ballard Scoring (NBS) chart at the time of admission.
Results: The mean duration to achieve full feeding either by direct breast feeding or cup feeding in oro-gastric and naso-gastric tube groups are (6.18±0.61) and (6.47±0.59) days respectively. This study will help in the individualization of the mode of gavage feeding in various institutions across the country.
Conclusions: In the present study the episodes of non-intentional removal and displacement are more in OGT group and it is statistically significant ($p = 0.012$ and $p < 0.0001$ respectively). The episodes of feed intolerance are more.

Keywords: Apnoea, Gavage feeding, Naso-gastric tube, Oro-gastric tube, Preterm

INTRODUCTION

The establishment of safe oral feeding in preterm or low birth weight infants may be delayed because of poor co-ordination of sucking and swallowing, neurological immaturity and respiratory distress. For gavage feeding policy and practice varies between and within neonatal care units (Shiao, Birnbaum, Gregory).[1-3] Enteral feeds may be delivered through a catheter (feeding tube) passed via the nose or via the mouth. Enteral feeding tubes passed via the nose are easier to secure to face than orally placed tubes. However, since newborn infants are obligate nose breathers, feeding tubes placed via the nose can cause partial nasal obstruction, which increases airway resistance and work of breathing (Stocks, Greenspan).[4,5] Orally placed enteral tubes are more frequently malposition compared to nasally placed tubes (Ellett).[6] Incorrect placement or subsequent displacement of feeding tubes into the lower esophagus or into the lung can lead to aspiration, respiratory compromise and increased energy expenditure.

This study was planned to compare orogastric and naso-gastric route for placing feeding tube to see the primary outcome in terms of duration to achieve full feeding either by direct breast feeding or cup feeding, and various secondary outcomes encountered during this period.

The objective of this study was to determine effect of nasal versus oral placement of enteral feeding tubes on

duration to achieve full feeding and the incidence of adverse events in preterm (28-34 weeks) neonates.

METHODS

The present study was conducted in a Tertiary Care Hospital from August 2013-July 2014. Ethical approval for this study was obtained from Institutes Ethics Committee. The study was conducted in in-patient of SCNU (Sick Newborn Care Unit) of Department of paediatrics. Written and informed consent was obtained from the parents or legal guardians prior to study. In the study, groups were divided in 2 groups (Oro-gastric tube (OGT) group and Naso-gastric tube (NGT) group. All patients in the study were randomly enrolled in groups as per gestational weeks between 28-34 weeks by using New Ballard Scoring (NBS) chart at the time of admission. Inclusion and exclusion criteria fulfilled during enrolment of the cases.

Inclusion criteria

Neonates between 28-34 gestational weeks required gavage feeding within 1 hour of birth.

Exclusion criteria

- Major congenital anomaly
- Perinatal asphyxia
- Respiratory distress syndrome (Hyaline membrane disease)
- Gestational age <28 weeks and >34 weeks
- Extremely low birth weight (<1000 gm)
- Hemodynamically unstable patient
- Apnea
- Bradycardia
- Oxygen requirement at the time of admission.

In OGT group patients a 5 fr size infant feeding tube was placed via mouth and in NGT group patient via nose and fixed with adhesive tape with all aseptic precaution by standard method (Nose-Ear-Mid-Umbilicus). Daily monitoring of vitals and weight were done. Feeding (expressed breast milk) is given as intermittent bolus (2 hourly) form and infant feeding tube was continuously placed in situ. All cases were followed till their primary or secondary outcome recorded.

Primary outcome

Average duration to achieve either direct breast feeding or full oral feeding (cup feeding) (i.e. crossed 2/3rd daily fluid requirement).

Secondary outcome

- Incidence of apnoea, bradycardia, de-saturation and oxygen requirement
- Incidence of feed intolerance

If in any case apnoea, bradycardia, de-saturation, oxygen requirement and feed intolerance episode occur it was the end point of the study. Apnoea is defined as breathing pauses that last for >20 seconds or for >10 seconds if associated with bradycardia (HR <100/min) or oxygen de-saturation (SpO2<88%).

For each episode of non-intentional removal or displacement new infant feeding tube is placed and fixed and record of this kept for each patient till there Feed intolerance was diagnosed on the basis of vomiting of altered milk (bile, blood) or increased abdominal girth by ≥2cm or increased pre-feed gastric residual volume >25%. Conclusion was drawn statistically to compare both the groups. Statistical analysis was done using Stata 11 and Microsoft Excel.

RESULTS

In Oro-gastric Group A out of 100 cases, 54 males and 46 females were included in this study. Thirty two percent (32%) of study cases were between 28-30 weeks, 35% of study cases were between 30-32 weeks and 33% cases were between 32-34 weeks.

In Nasogastric Group B out of 100 cases, 55 males and 45 females were included in this study. Thirty-four patients (34%) of study cases were between 28-30 weeks, 34% of study cases were between 30-32 weeks and 32% cases were between 32-34 weeks. Mean NBS score for OGT group and NGT group were (17.12±0.91) and (17.27±0.95) respectively. The Baseline characteristics of the new-borns are presented in the Table 1.

Table 1: Distribution according to baseline characteristics.

Base line characteristics		OGT group	NGT group
Sex	Male	54	55
	Female	46	45
Total		100	100
Weight	Vlbw	59	54
	Lbw	41	46
Total		100	100
Gestational age	≥28 - <30 weeks	32	34
	≥30 - <32 weeks	35	34
	≥32 - ≤34 weeks	33	32
Total		100	100

Primary outcome- duration to achieve full feeding either by direct breast feeding or by cup feeding. Comparison of both the groups for primary outcome has shown in the Table 2.

Orogastric tube group neonates required (6.18±0.61) days as compare to Nasogastric tube group neonates as they required (6.47±0.59) days to achieve full feeding but it is statistically insignificant (P =0 .368).

Table 2: Primary outcome-duration to achieve full feeding either by direct breast feeding or by cup feeding.

Primary Outcomes	OGT group N = 100	NGT group N = 100	P value
Mean duration to achieve full feeding in days (Mean±SD)	6.18±0.61	6.47±0.59	0.368

In this study, on simultaneously assessing the secondary outcomes there is statistically significant difference in mean incidence of non-intentional removal of Oro-gastric tubes (4.31±0.37) as compared to naso-gastric tubes (3.71±0.49) (p = 0.012).

Table 3: Secondary outcomes.

Group	OGT group n = 100	NGT group n = 100	P value
Displacement (Mean±SD)	5.28±0.50	2.39±0.39	<0.0001
Removal (Mean±SD)	4.31±0.37	3.71±0.49	0.012

There is statistically significant difference in mean incidence of non-intentional displacement of Oro-gastric tubes (5.28±0.50) as compared to naso-gastric tubes (2.39±0.30) (p<0.001) as depicted in Table 3. Apnoea, bradycardia, de-saturation and oxygen requirement seen simultaneously in both the groups and incidence are 19% and 21% respectively ($\chi^2 = 0.03$, p = 0.86).

Table 4: Secondary outcomes.

Group	OGT group n = 100	NGT group n = 100	P value
Apnoea, bradycardia, de-saturation, O_2 requirement	19	21	0.86
Feed intolerance	16	14	0.84
Aspiration	00	00	-

The incidence of feed intolerance is 16% and 14% in both the groups respectively ($\chi^2 = 0.04$, p = 0.84) as shown in Table 4.

DISCUSSION

Nutritional management influences immediate survival as well as Subsequent growth and development of premature infants. Breastfeeding requires effective Sucking, swallowing and a proper coordination between suck/swallow and breathing. These complex skills mature with increasing gestation. Infants usually cannot co-ordinate sucking and swallowing before 34 weeks gestation. Before establishment of breastfeeding, milk Feeding in these infants can be administered via different routes include: intra-gastric (naso-gastric or oro-gastric) and oral feeding (cup, bottle, spoon, syringe or palladai). Both naso-gastric and oro-gastric tubes feeding are used in neonatal Intensive care units. Policies and practices varies institution to institution, there is not enough evidence at present to make any Recommendation regarding the superiority of either routes of feeding.[7,8]

Dsilna concluded that there is no significant difference in the Establishment time of full oral feeding MD - 2.7 (95% CI - 11.9 to 6.5).[10] Also in this study did not report the incidence of frequency of apnoea, de-saturation or bradycardia.

In the present study average duration to achieve full feeding either by direct breast feeding or by cup feeding is observed more in NGT group (6.47±0.59) days as compared to OGT group but it is statistically insignificant (6.18±0.61) days (p = 0.368).

Bohnhorst did not find any statistically significant differences in the frequency of apnoea, de-saturation or bradycardia. The median (inter-quartile range) number of bradycardia/de-saturation episodes per hour: nasal 1.6 (95% CI 0.8 to 1.9) versus oral 1.0 (95% CI 0.9 to 1.6); median (inter-quartile range) number of apnoea episodes per hour: Nasal 0.8 (95% CI 0.7 to 1.2) versus Oral 0.8 (95% CI 0.5 to 1.2).[9] Someren V did not find any statistically significant differences in the frequency of Episodes of apnoea between the groups on the third day post-randomization.[11] On the seventh day, the nasal placement group had statistically significantly more recorded episodes of apnoea. However, the definition of apnea was cessation of breathing for 5 seconds or greater rather than the more commonly used definition (cessation of breathing for ≥20 seconds).

In the present study episodes of apnoea, bradycardia, de-saturation and oxygen requirement are more in NGT group as compared to OGT group but statistically Insignificant OGT versus NGT ($\chi^2 = 0.03$, p = 0.86). None of the trials reported the incidence of non-intentional removal or displacement of feeding tube or the incidence of aspiration pneumonia/pneumonitis.

In the present study the episodes of non-intentional removal and displacement are more in OGT group and it statistically significant (p = 0.012 and p<0.0001 respectively). The episodes of feed intolerance are more in OGT group, but it is statistically insignificant ($\chi^2 = 0.04$, p = 0.84). None of patient in the both of group had episode of aspiration while on gavage feeding.

CONCLUSION

Gavage feeding is the important mode of feeding in hospitalized premature new-borns. Policy and practice

varies between and within neonatal care units regarding gavage feeding. This study will help in the individualization of the mode of gavage feeding in various institutions across the country.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Shiao SY, DiFiore TE. A survey of gastric tube practices in level II and level III nurseries. Issues of Comprehensive Pediatric Nursing. 1996;19(3):209-20.
2. Birnbaum R, Limperopoulos C. Non-oral feeding practices for infants in the neonatal intensive care unit. Advances in Neonatal Care. 2009;9(4):180-4.
3. Gregory KE, Connolly TC. Enteral feeding practices in the NICU: results from a 2009 Neonatal enteral feeding survey. Advances in Neonatal Care. 2012;12(1):46-55.
4. Stocks J. Effect of nasogastric tubes on nasal resistance during infancy. Arch Dis Childhood. 1980;55(1):17-21.
5. Greenspan JS, Wolfson MR, Holt WJ, Shaffer TH. Neonatal gastric intubation: differential respiratory effects between nasogastric and orogastric tubes. Pediatr Pulmonol. 1990;8(4):254-8.
6. Ellett ML, Maahs J, Forsee S. Prevalence of feeding tube placement errors and associated risk factors in children. Am J Maternal Child Nurs. 1998;23(5):234-9.
7. Edmond K, Bhal R. Optimal feeding of the low birth weight infants. Technical Review. World Health Organisation; 2006:1-130.
8. Hawes J, McEwan P, McGuire W. Nasal versus Oral route for placing feeding tubes in preterm or low birth weight infants. Cochrane Database Sys Rev. 2007;4:CD003952.
9. Bohnhorst B, Cech K, Peter C, Doerdelmann M. Oral versus nasal route for placing feeding tubes: no effect on hypoxemia and bradycardia in infants with apnoea of prematurity. Neonatol. 2010;98(2):143-9.
10. Dsilna A, Christensson K, Alfredsson L, Lagercrantz H, Blennow M. Continuous feeding promotes gastrointestinal tolerance and growth in very low birth weight infants. J Pediatr. 2005;147(1):43-9.

Cite this article as: Ambey R, Gogia P, Manager K. Mode of gavage feeding: does it really matters. Int J Contemp Pediatr 2018;5:1222-5.