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A COMPARATIVE EVALUATION OF CONTINUOUS AND INTERMITTENT NASOGASTRIC FEEDING IN LBW NEONATES.

Paediatrics

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ABSTRACT

Background: To compare outcome between continuous and intermittent nasogastric feeding in low birth neonates. **Objective:** The aim of this study was to compare outcome between continuous and intermittent nasogastric feeding in low birth neonates. **Methods:** 80 Patients were randomally divided in two groups i.e group A and group B. The neonates in the Group A received continuous nasogastric feed via continuous infusion pump while in Group B neonates received intermittent nasogastric feed in the form of boluses every 2-3 hour over 15-20 minute duration. Each neonate was followed for 15 days, Then data was collected and analysed. If there were no other clinical signs, feeding was stopped for three hours . After 15 days outcomes were recorded and analaysed that which feed had better results. **Result:** Mortality was reported more in group B as compared to group A. Morbidity was reported more in group B as compared to group A. Regaining of birth weight (in days) was found earlier in group A as compared to Group B. **Conclusion :** While comparing continuous feeding with intermittent feeding in low birth weight neonates we reached on conclusion that continuous feeding is better then intermittent feeding in terms of various outcomes.

KEYWORDS

LBW, continuous and intermittent nasogastric feeding .

INTRODUCTION

According to the World Health Organization (WHO), a birth weight of less than 2500 g (up to and including 2499 g) is considered to be low birth weight (LBW)[1]. In India, the prevalence of low birth weight ranges between 25 and 30%, with 60 to 65% of cases being caused by intrauterine growth retardation[2]. Around 18 million newborns worldwide are born each year weighing less than 2500 g. Though these infants constitute only 14% of total live births, they account for 60-80 % of total neonatal deaths. These deaths can be prevented by extra attention to warmth, prevention of infections & more importantly optimal feeding. Also infants who survives, show unclear prospects, ranging from poor neurodevelopmental outcomes to insufficient postnatal growth[3]. There is a relation between the neurocognitive outcome and growth, therefore reason an adequate nutrition is essential for the optimal growth and health.[4-7]

The continuous nasogastric tube feeding technique for preterm newborns was first documented in 1972[8]. A minimum amount of enteral feeding is initiated as soon as feasible after delivery in many hospitals across the world, and it is gradually increased daily through tube feeding. Bolus feeding through a tube every two to three hours or continuous infusion pump feeding are both options[9]

By increasing energy absorption and decreasing energy expenditure, continuous nasogastric feeding enhances growth and favours feeding tolerance.[10] Additionally, it enhances splanchnic oxygenation and duodenal motor function, although there is a chance that considerable amounts of nutrients will be lost in the delivery system. Additionally, it's possible that continuous feeding alters the gastrointestinal tract's hormone cycle, disrupting the functioning of the lower esophageal sphincter and thus contributing to the development of gastroesophageal reflux disease and altering metabolic homeostasis[11].

MATERIALS AND METHOD

All Preterm and Low birth weight neonates admitted in neonatal care unit were screened for eligibility. Eligible 80 neonates were enrolled in the study after taking consent from parents/ guardians. Two study groups were formed in the study i.e. group A and B.

The neonates in the Group A received continuous nasogastric feed via continuous infusion pump while in Group B neonates received intermittent nasogastric feed in the form of boluses every 2-3 hour over 15-20 minute duration. Neonates were assigned to either group by randomisation. Randomisation was done by using sequentially numbered opaque sealed envelopes using a table of random numbers.

Amount of feed was decided by age, birth weight and on the basis of clinical judgement.

Each neonate was followed minimum for 15 days, hen data was collected and analysed.

Gastric residuals were measured with the same catheter every 2 hours in the continuous nasogastric feeding group and every 2 hours (pre-feed) in the intermittent bolus feeding group .

Feeds were discontinued for 3 hours if residuals were excessive and there were no other clinical findings.

Primary Outcomes

a. Rate of weight gain/kg/day.
b. Duration of hospital stay.
c. Duration to reach full enteral feeds.
d. Duration to regain birth weight.

Secondary Outcomes

a. Feeding intolerance w.r.t. regurgitation, abdominal distension and residual feed.
b. NEC
c. Septicaemia

RESULT

Table 1: Gender Distribution Among The Study Groups

Gender	CNG		ING		p value
	N=40	%	N=40	%	
Male	23	57.5	21	52.5	0.41
Female	17	42.5	19	47.5	

The present open labelled, randomized controlled trial study was conducted in Neonatal care unit, Department of Pediatrics, Chhatrapati Shivaji Subharti Hospital, Subharti Medical College, Meerut from September 2020 To June 2022 among 80 preterm babies who were unable to take oral feeds. The aim of the study was to compare the outcome between continuous and intermittent nasogastric feeding in low birth neonates. Out of 80 neonates, 40 neonates were given CNG feed and 40 neonates were given ING feed). Males were slightly more in both the study groups (table 1)

Table 2: Comparison Of Outcome Among The Study Groups

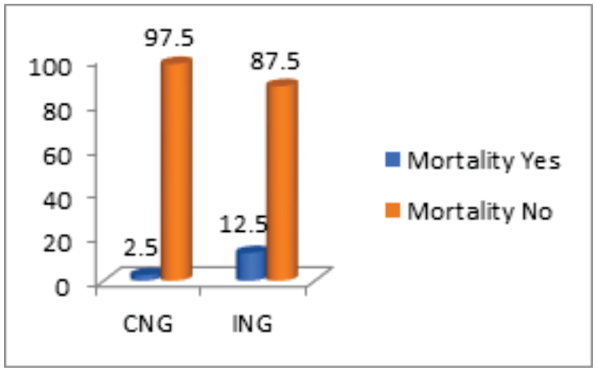
Variables	CNG		ING		p value
	Mean	SD	Mean	SD	
Regain Birth Weight (in days)	12.6	5.17	12.84	4.72	0.19
Full Enteral Feeds (in days)	14.73	4.91	15.68	4.79	0.10
Reach Discharge weight (in days)	61.96	8.05	64.50	6.98	0.14

Table 2 shows the comparison of outcome among the study groups. Regaining of birth weight (in days) was found earlier in CNG group (12.6±5.17) as compared to ING group (12.84±4.72), though no significant difference was found. Similarly full enteral feeds (in days) was achieved earlier in CNG group (14.73±4.91) as compared to ING group (15.68±4.79). Mean days taken to reach discharge weight was 61.96 and 64.50 in CNG and ING group respectively with statistically insignificant difference as p>0.05.

Table 3: Morbidity Among The Study Groups

Morbidity	CNG		ING		p value
	N=40	%	N=40	%	
Apnea	1	2.5	3	7.5	0.29
Abdominal Distension	3	7.5	2	5	0.71
Vomiting	2	5	4	10	0.22
Nasogastric Aspirates	0	0	3	7.5	0.11

Overall morbidity was reported more in ING as compared to CNG group, though no significant difference was found. Apnea, abdominal distension, vomiting and nasogastric aspirates was found in 2.5%, 7.5%, 5%, 0% and 7.5%, 5%, 10% and 7.5% of the subjects in CNG and ING group respectively.



Graph 1 – Shows Mortality Among Study Groups.

Mortality was reported among 12.5% of the subjects in ING group while the same was revealed in 2.5% of the subjects in CNG group. When mortality was compared among the group using chi square test, insignificant difference was found as p>0.05

DISCUSSION

Human milk has essential nutrients and immunologic factors for preterm infants. However, tube feeding is necessary for very low birth weight (LBW) infants because they are unable to coordinate sucking, swallowing, and breathing.[12-13] Previous studies have demonstrated the impacts of continuous and intermittent milk feeding in preterm infants and suggested associations between continuous feeding and energy efficiency, duodenal motor function, nutrient absorption, and splanchnic oxygenation. However, intermittent bolus feeding increases protein accretion, stimulates the development of the gastrointestinal system, and causes a more physiological release pattern of gastrointestinal tract hormones. [14-15].

Due to conflicting literature, the present open labelled, randomized controlled trial study was conducted in Neonatal care unit, Department of Pediatrics, Chhatrapati Shivaji Subharti Hospital, Subharti Medical College, Meerut from September 2020 to June 2022 among 80 preterm babies who were unable to take oral feeds. The aim of the study was to compare the outcome between continuous and intermittent nasogastric feeding in low birth neonates.

Gender

In the present study; out of 80 neonates, 40 neonates were given CNG feed and 40 neonates were given ING feed). Males were slightly more in both the study groups.

Sadia Riaz et al[14] in their study revealed similar male dominance.

Outcome

Regaining of birth weight (in days) was found earlier in CNG group (12.6±5.17) as compared to ING group (12.84±4.72), though no significant difference was found. Similarly full enteral feeds (in days) was achieved earlier in CNG group (14.73±4.91) as compared to ING group (15.68±4.79). Mean days taken to reach discharge weight was 61.96 and 64.50 in CNG and ING group respectively with statistically insignificant difference as p>0.05 in this study.

According to Cochrane meta-analysis, both feeding methods take same time to reach full enteral feedings[16].

The study by Schanler et al[17] also supports these findings. Their study showed that the proportion of the 3-hour feeding volume that the gastric residual surpasses by 50% was nearly twice as high in the continuous feeding as compared to the bolus feeding. They do, however, take note of the time difference to attain full enteral feedings in low birth weight infants with a gestation age of 26-27 weeks between both feeding methods

Morbidity

Overall morbidity was reported more in ING as compared to CNG group, though no significant difference was found. Apnea, abdominal distension, vomiting and nasogastric aspirates was found in 2.5%, 7.5%, 5%, 0% and 7.5%, 5%, 10% and 7.5% of the subjects in CNG and ING group respectively.

In a Cochrane meta-analysis, there was a significant difference between feeding intolerance of both feeding strategies.[18]

In a study by Sadia Riaz et al[14], there is also no significant difference of safety between continuous or intermittent bolus feeding.

Juan Ye et al[19] in their meta-analysis found that there were no significant differences in the number of apneas and in the number of stools between the two feeding strategies.

Ahmad S Farhat et al[20] revealed similar findings as mentioned in our study.

Mortality

Mortality was reported among 12.5% of the subjects in ING group while the same was revealed in 2.5% of the subjects in CNG group. When mortality was compared among the group using chi square test, insignificant difference was found as p>0.05.

Continuous methods have been recommended as a way of increasing energy efficiency because of improved absorptive capacity by the gut as a means of decreasing the amount of time required to reach full feedings and as the best method for infants with intestinal disease.

The limitation of present study is small sample size.

CONCLUSION

In this study we concluded that Continous nasogastric feeding is better then intermittent nasogastric feeding as there is less adverse effects and low mortality noted with continuous feeding.

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