Comparison of Continuous and Intermittent Feeding Methods in Low Birth Weight Infants

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Abstract

Objective
About 1 % of infants are of very low birth weight. However, they comprise about 50% of infant mortality. We compare the effects of continuous versus intermittent feeding on physical growth, gastrointestinal tolerance and macronutrient retention in low birth weight infants (<1.5 Kg).

Methods
A prospective randomized trial clinical trial was performed from 2004-2005. Very low birth weight neonates (n=73) stratified by birth weight were randomly assigned to either the continuous (24-hour) pump group (n=37) or intermittent (every 2 hours) nasogastric tube feeding group (n=35). Weight was measured and recorded on the 3rd , 7th , 10th ,13th ,16th ,19th ,22nd day and at discharge. Data was analyzed via SPSS software, t-student and chi-square tests.

Results
There were no significant differences in birth weight, gestational age, first feeding age and weight at beginning study. Of the 73 neonates, 61 neonates were discharged from hospital, 11 neonates died and one of them dropped out of the study because of early discharge. There were no significant differences in weight gaining, feeding tolerance, discharge weight (p=0.33) or severity of respiratory distress between the groups.

Conclusion
This study showed that there were no differences in infant growth relative to the type of feeding.

Keywords
Very low birth weight, infant, intermittent feeding , continuous feeding

Introduction

Various regimens have been used for feeding preterm infants; but the optimal method of feeding in very low birth weight neonates (VLBW) remains to be defined. The data on the relative merits of intermittent and continuous nasogastric methods of feeding in low birth weight infants is sparse.[1,2]

Previous studies comparing intermittent and continuous nasogastric feeding methods in (VLBW) neonates are either retrospective or of insufficient sample size.[1-4] None of these studies demonstrate which feeding method is superior.

The objective of this study was to compare the effect of continuous and intermittent feedings on VLBW neonates.

Methods

This randomized clinical trial was undertaken at the NICU at the Imam-Reza Hospital from 2004 to 2005; 73 infants were included in the study.

Sample size was calculated with a 95% confidence interval.

Very low birth weight neonates who met the following criteria were included in the study: Birth weight less than 1.5 Kg, absence of major congenital malformations, free from serum or antibiotic therapy and feeding volume was 100cc/kg.

Infants were randomly assigned to either continuous or intermittent feeding groups. Baseline demographic and medical data were recorded for each infant.

The study protocol was approved by our ethics committee. Informed consent was obtained from the mothers before randomization. Data collected via questionnaire was filled-out for each infant.

Weight was measured and recorded on the 3rd, 7th, 10th, 13th, 16th, 19th, 22nd day and

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Table 1– Comparison status of the study population according to their sex and score

variable	Continuous nutrition N (%)	Intermittent Nutrition N (%)	P- Value
sex female	16 (43.2)	22 (61.1)	0.12
male	21 (56.8)	14 (38.9)	
APGAR ≤ 5	4 (10.8)	5 (14.3)	0.65
>5	33 (89.2)	30 (85.7)	

Table 2 – Comparison of variables in two study groups

Variable	Continuous nutrition mean ± SD**	Intermittent Nutrition mean ± SD	P- Value*
Birth weight (gram)	1204/0±209.4	1260/8±205/1	0.94
Pregnancy age at birth (week)	31/2±2/0	30/8±1/9	0.68
Age at starting nutrition (day)	3/67±1/7	3/89±2/2	0.45
Weight (gram)	1185/1±190/0	1205/±200/0	0.47
Age(day)	8/8±5/0	8/5±3/7	0.28

*P-Value based on t-test **Standard deviation

Table 3 – Comparison of mean weight gain in babies with continuous nutrition and intermittent nutrition in different ages

	Intermittent nutrition			**Continuous nutrition**			
Age	**N**	**Mean weight gain (gram)**	**SD**	**N**	**Mean weight gain (gram)**	**SD**	**P- Value**
3rd day	32	7/1	41/3	31	28/3	43/7	2/1
7th day	30	58/3	58/3	28	63/2	52/9	0/33
10th day	28	97/8	61/1	20	112/2	49/0	0/87
13th day	20	148/5	59/2	13	163/0	55/2	0/70
16th day	17	227/6	63/7	14	225/0	71/1	0/1
19th day	14	267/1	116/1	11	243/6	68/8	0/59
day	10	290/0	122/1	8	280/0	96/2	0/18
Release day	30	250/3	151/4	31	219/6	147/5	0/8

at discharge. Neonatal weight was checked in the morning and before feeding using a French bascule (Brevet ET model 79155 with ± 10 g reliability). Data was analyzed via SPSS software, t-student and chi-square tests ($p<0.05$).

Results

There was no significant differences between neonates with regard to gender and APGAR scores (.).

There were no significant differences between the 2 groups with regard to birth weight, gestational age, first feeding age, weight and age at the beginning of the study (Table 2.) .

There was a significant difference in weight gain only on the 3rd day (Table 3.) .Also there was no significant difference between 2 groups with regard to mean weight upon follow-up. Neonates with higher birth weight had gained weight better.

Of the 73 neonates, 61 neonates were discharged from hospital, 11 neonates died and one of them dropped out of the study because of early discharge. There were no significant differences in weight gaining, feeding tolerance, discharge weight ($p=0.33$) or severity of respiratory distress between the groups .

Eight neonates developed sepsis ; 3 (18.5%) were neonates in the intermittent feeding and 5 (13.5%) neonates in the continuous group. One neonate developed NEC in the intermittent feeding group and had positive blood culture for kelbsiella. One neonate developed IVH and one developed pulmonary hemorrhage in the intermittent feeding group.

Discussion

Feeding in the intermittent group began at age 3.29±2.2 days and in the continuous group at age 3.67±1.7days. Mean age of intermittent group at the beginning of the study was 8.5±3.7 days and in the continuous group was 8.8±5 days. Our results confirm that of Premji[2] and Akintorin's study results; however, in Dollberg's study[4] the intermittent group received complete feeding earlier than the continuous group. Complete feeding was 160 cc/kg in their study.

In Rojans' study [5] infants received 120 cc/kg feeding in the continuous group for 7 days and in intermittent group for 12 days.

But, there was no significant difference between 2 groups. Premjis'[2] study results that in the continuous group weight gain was earlier.

Schanler [6] and Grant[7] in similar study showed that in the intermittent group weight gain was earlier than in the continuous group. In this study group they used mother milk and formula.

In Akintorin's[3] study intermittent group achieved birth weight on the 12th day and in the continuous group on the 12th day as well and there were no differences between the 2 groups.

During our study neonates complicated with non-tolerance feeding and were similar to sepsis; 8 neonates (8.5%) were in the intermittent group and 5 neonates (13.5%) were in continuous group. There were 2 positive blood cultures (in one neonate kelbsiella and in the other entrobacter) in continuous group similar to Premji's study results which showed that in the continuous group there was an accelerated infection risk because of pump contamination.

We had a neonate which developed NEC. In Akintorin's study[3] in the continuous group 6 neonates (15%) from 39 neonates and in intermittent group 3 neonates (7%) from 41 neonates developed NEC. Behrman showed that 1-5% of neonates in the NICU developed NEC.

There was no significant difference between the 2 groups. During the study 1 neonate died because of IVH and 1 neonate because of lung hemorrhage. These 2 neonates were in the intermittent group.

In this study there was no significant difference between 2 groups in feeding tolerance, birth weight, discharge weight, weight gaining or hospitalization time in the NICU.

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