Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 32s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Effectiveness Of Left Lateral Position on Feeding Tolerance Among Preterm Neonates: A Randomized Controlled Trial

Roja Rani. Chakravartula*[1], Anita David[2], Alimelu. Madireddy[3], Shaik Mohammad Shafijan[4]

[1*]Department of child health nursing, Government College of Nursing, Secunderabad, India

[2]Department of Neonatology, Nilofer Hospital, Hyderabad, India,

[3]Department of Pediatric Nursing, Sri Ramachandra Institute of Higher Education and Research, Chennai, India,

[4]Department of Neonatology and Pediatric Medicine, Sri Ramachandra Institute of Higher Education and Research, Chennai, India

Corresponding author:

Roja Rani Chakravartula

[1*]Department of child health nursing, Government College of Nursing, Secunderabad, India

Email ID: rojaranichakravartula@sriramachandra.edu.in

Cite this paper as: Roja Rani. Chakravartula, Anita David, Alimelu. Madireddy, Shaik Mohammad Shafijan, (2025) Effectiveness Of Left Lateral Position on Feeding Tolerance Among Preterm Neonates: A Randomized Controlled Trial. *Journal of Neonatal Surgery*, 14 (32s), 3224-3233.

ABSTRACT

Preterm neonates often experience digestive issues due to underdeveloped anatomical and functional capabilities as well as immature nervous system function in the gut. Feeding tolerance significantly influences their nutritional status. A noninvasive post-feeding position could improve feed tolerance and promote growth. A randomized controlled trial was conducted to evaluate the effectiveness of the left lateral position on feeding tolerance among preterm neonates and its association with weight gain, on 223 preterm neonates in the Special Newborn Care Unit (SNCU). The study group placed the preterm neonates in the post-feeding left lateral position, while the control group placed them in other recommended positions. Feeding tolerance was assessed based on the quantity of feed prescribed, the number of vomiting episodes, the number of days on an IV line, and abdominal distension measured by abdominal circumference before and after each feed over five consecutive days. Preterm demographics and selected variables were analyzed using descriptive and inferential statistics. A t-test was used to compare the differences in mean abdominal circumference, and the chi-square test was applied to determine the association between the left lateral position and weight gain. The effect size of the difference between groups was 0.352. The mean difference in abdominal circumference among preterm neonates in the post-feed left lateral position was statistically significant ($p < 0.05$). Additionally, a significant association ($p < 0.05$) was observed between the post-feed left lateral position and weight gain during the intervention, with similar trends noted at the 2nd and 4th-week follow-ups. Preterm neonates can be placed in the post-feed left lateral position, which improves feeding tolerance and significant weight gain.

Keywords: *Preterm neonate, feeding tolerance, left lateral position, abdominal circumference and distention, weight gain*

1. INTRODUCTION

Prematurity is considered a problem that interferes with adequate adaptation to extra uterine life [1]. Nutritional management in preterm neonates plays a vital role in adequate postnatal growth and for better long-term neurodevelopment [2]. At 3.2 million, India recorded the highest number of preterm births in 2020, according to the WHO report [3]. The birth rate of preterm babies in India is 13 [4]. WHO (2018) defines preterm as babies born alive before 37 weeks of pregnancy. Preterm complications are the leading cause of death among children under five years old [5,6].When a preterm neonate can safely consume and digest prescribed enteral feed without complications like aspiration, infection, or gastrointestinal issues, it can be considered feeding tolerance [7]. The incidence of feeding intolerance observed is nearly 29% in preterm neonates [8]. Preterm neonates have weak sucking and swallowing reflexes, immature body organs, especially the digestive system, and delayed gastric emptying [9]. They are prone to feeding intolerance manifested by regurgitation, vomiting, abdominal distension, and gastric retention during feeding, which contributes to delayed growth and hospital discharge [10,11].

The nutritional status of preterm infants is measured based on the amount of food residue from the last feeding to that at the start of the next feeding. Gastric emptying depends on numerous factors, such as milk type (mother milk or milk powder), volume, physical condition, and post feeding position [12]. Gastric residues are the simplest and most common surrogate marker for feeding intolerance in day-to-day neonatal practice [13]. Monitoring the abdominal girth every 2 hours before giving the next feed was practiced in all preterm infants admitted to the ICU for identifying the abdominal distention, as it helps in the early identification of feed intolerance and not routinely aspirating the gastric contents. Aspiration has to be done during an increase in abdominal girth by >2 cm from the baseline [14]. Measuring abdominal circumference is less invasive and equally effective as pre-feed aspiration [15].Duygu Gözen et al. reported no significant difference among the positions in the volume of gastric residuals in the measurements made at 60th, 120th, and 180th min [16]. Hoda and Samah found a significant difference between the supine position, the correct one position, and the proper two positions at different feeding times regarding the amount of gastric residual after feeding [17]. Varanpal Kaur et al. reported that the left lateral position was associated with higher but clinically non-significant pre-feed gastric residuals than the right lateral position. The right lateral position was associated with increased regurgitation episodes [18].

Emriye Hilal Yayan et al. found that premature had lower levels of gastric residue in the right lateral and prone positions and higher levels of gastric residue in the left lateral and prone positions. Gastric emptying was high in the right lateral position at 30, 60, and 120 minutes [19]. It was noted from the previous studies that the consensus is lacking on the appropriate position for a preterm neonate after feeding. There is an urgent and growing need for reliable evidence of the best post-feeding position to reduce the residual gastric volume and promote preterm growth and development [20]. The team of this research had observed in SNCU that the preterm neonates placed in the left lateral position had tolerated feeds with very few episodes of regurgitation and a few days on intravenous lines, and mothers also noted weight gain in a week reportedly. Ameri et al. recommended that healthcare professionals, especially nurses working in SNCU, be educated on how body position affects gastric residuals, the risks and benefits of different positions, and providing the appropriate position after feeding to prevent maximum gastric residual volume to help the preterm neonate [21]. The objectives of the study were to find the effectiveness of left lateral position on feeding tolerance in preterm and to analyze the association between feeding tolerance and weight gain in preterm infants

Hypothesis:

1. Preterm neonates placed in the post-feeding left lateral position exhibit more tolerance than those placed in other post-feeding positions.

2. There will be a significant association between selected variables and weight gain in preterm at $p < 0.05$.

2. MATERIALS AND METHODS

Trial Design: A randomized controlled trial design, single blinded

The **sample** was preterm neonates admitted at SNCU.

Setting: Single-center, Government Hospital for Women and Children in India with 1400 beds and tertiary-level care facilities for level III NICU/SNCU care, providing health care services to mothers and children

Sample size: Assuming a 95% CI with 80% power and an SD of weight on the last day of intervention was 240 grams, and the expected difference was 96.91 grams. The required sample size was 97 per group, considering 15% of attrition, the sample size was 112 per group. (considered as 115 per group, and the total size was 230)

Sampling technique: A simple random technique was used to select 230 preterm neonates admitted at SNCU, and 223 were recruited by block randomization, using computer-generated randomized numbers in sealed opaque envelopes. A total of 114 preterm neonates were allocated to the study group and 109 to the control group. The study period was 12 months (from November 2021 to October 2022).

Inclusion and exclusion criteria: Preterm neonates born between 30 weeks - 36 6/7 weeks gestation, with a birth weight of 1000 grams to < 2500 grams, admitted in level I & II SNCU at inborn and out born units, stable and available for one week before the discharge were selected. Preterm neonates with congenital anomalies, ARDS, Sepsis, on CPAP/ Ventilation, and from places other than domicile state were excluded from the study. The study was carried out in accordance with the guidelines of the consort of recruitment, depicted in **Figure 1.**

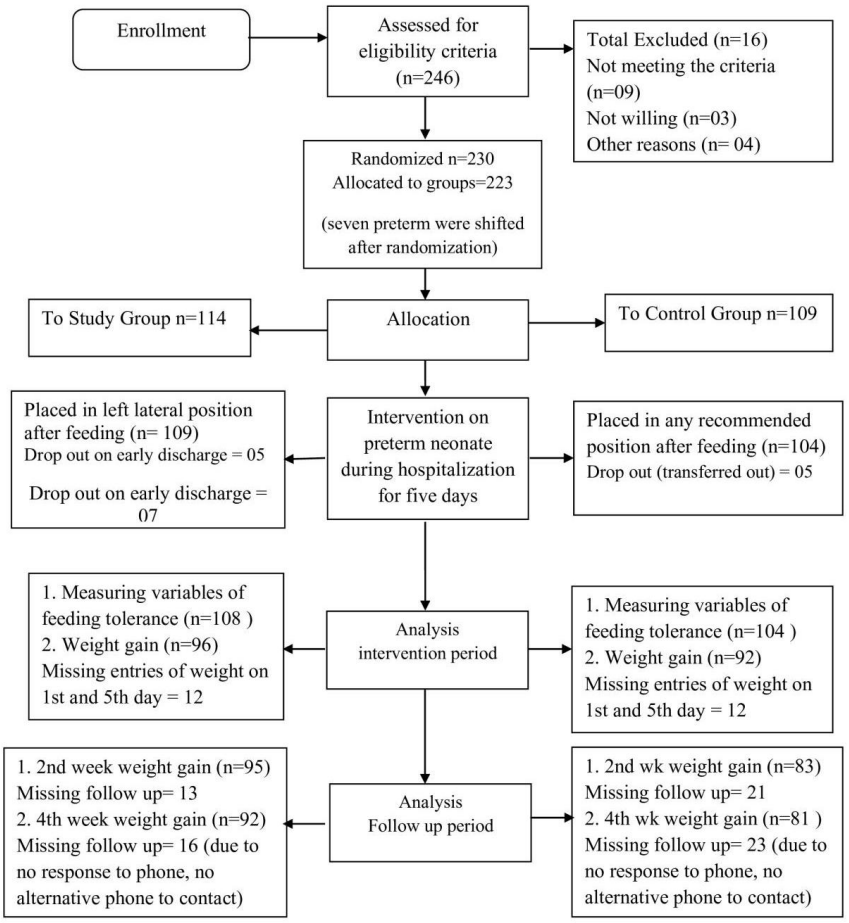

Figure1 Consort Flow Diagram of Study Recruitment

Study Variables: The Dependent variables were preterm feeding tolerance measured by the amount of feeding prescribed, the number of days of intravenous (IV) fluids, the number of vomiting episodes, abdominal circumference, and weight. The independent variable was the left lateral position.

Ethical consent: The mother/ significant family member was explained about the intervention and obtained informed consent.

Data collection procedure: The principal investigator recruited and trained two registered graduate nurses to assess, measure, and record the study variables of preterm neonates. In consultation with the neonatologists in charge of SNCU, the tentative date for discharge was noted. Randomisation was done on the first day of intervention, ranging from <10 days to >23 days of life. Eligible and stable preterm neonates advised for oral feeds were listed per the admission date. The prescribed amount of the mothers' expressed breast milk/human donor milk ranged from 20 ml to 180 ml/kg/day. Feed tolerance was assessed by the quantity of feed prescribed, the number of episodes of vomiting, and abdominal distension, measured by abdominal circumference, and the number of days on the IV line. Computer-generated randomized numbers in sealed opaque envelopes were used to assign subjects to the study and control groups by block randomization of groups. Baseline data of the preterm neonate was recorded in the proforma as per the case sheet. SNCU nurses on duty and the biostatistician were blinded about the subjects under study. The study period was 12 months (from November 2021 to October 2022), including the pilot, main, and follow-up.

Malhotra AK et al. reported that whenever abdominal girth increased by two cm or more, aspirate was more than 23% and hence recommended that instead of routine gastric aspirate before each feed, an increase in abdominal circumference of at least two cm may be taken as a warning to withhold or to reduce the volume of oral feeds [22].

The mother or significant family member was feeding the preterm neonate in the SNCU as per the amount and schedule suggested by the consultant. They were requested to inform the investigator(s) before feeding the preterm neonate. Details of feed amount, IV fluids, and vomiting episodes were recorded from the case sheet. The abdominal circumference was measured with an interval of two hours, before and after each feed in both groups, to six readings between 9 a.m. and 3 p.m. every day for five consecutive days, as Kurvatteppa Halemani followed a similar schedule [13]. A standard non-stretchable

measuring tape (with markings up to 1 mm) was used to measure at the level of the umbilicus or just above it in the case of the umbilical clamp with babies lying in the supine position. An increase in the pre-feed abdominal circumference of > 2 cm during subsequent feeds was considered a sign of feed intolerance. [21] The preterm neonate whose general condition required further invasive or non-invasive interventions and Nil Per Oral (NPO) orders and missed two consecutive readings during the intervention was dropped from the study. The preterm neonates in the study group were placed in a post-feed left-lateral position for an hour. The details of vomiting/regurgitation could be collected only for the study group, as the preterm in the control group were placed in different recommended positions after feeding. Scores of abdominal circumference, days on the IV line, amount of feed prescribed, and episodes of vomiting were recorded in the proforma prepared by the investigator. The investigator provided a post-feed left lateral position to the preterm neonates in the study group during the five days of intervention. It was left to the mother's choice to adopt a post-feed position after the intervention.

Pilot Study: Conducted from November 12, 2021, to November 26, 2021, at SNCU and completed in February 2022. Reliability was tested using Pearson's and Cronbach's alpha formulas, which was 0.86.

Data analysis: SPSS version 24 was used for statistical analysis. Preterm demographic variables and abdominal circumference readings were computed using descriptive statistics like mean, SD, and percentages in both groups. Differences in abdominal circumferences and weight gain were calculated as the fifth day minus the first day. The difference in abdominal circumference after and before feeding was categorized into < 0.6cm, 0.6 cm, -0.9 cm, and >0.9 cm. Weight gain was categorized as < 0.040 kg (40 grams) and > 0.040 kg (40 grams). A t-test was applied to compare the differences between abdominal circumference and weight gain. A chi-square test was performed to study the association across the groups between categories of differences in abdominal circumference and weight gain during intervention and follow-up. The magnitude of the difference between groups was assessed by effect size. P value was considered as 0.05

Results: A total of 223 preterm neonates were recruited for the study. On the fifth day of intervention, 212 remained. 178 and 173 could complete the second and fourth-week follow-ups after discharge respectively. Discharge before the completion of the intervention, long distance of residence, and non-responsiveness to the phones were the reasons for the sample attrition.

Table 1. Characteristics of Preterm Neonate

Variable	**Distribution**	**Study Group N= 114**	**Control Group N= 109**	χ^2	**p**
		F (%)	**F (%)**		
Gender	Female	57 (50)	62 (56.9)	1.060	0.303
	Male	57 (50)	47 (43.1)		
Gestational Age at birth in weeks	30 - 31	29 (25.5)	32 (29.4)	5.360	0.252
	32 - 33	60 (52.6)	47 (43.1)		
	34 - 35	16 (14)	24 (22)		
	36 - < 37	9 (7.9)	6 (5.5)		
Birth Weight in Grams	1000 - 1250	27 (23.7)	30 (27.5)	1.090	0.896
	1251 -1500	44 (38.6)	39 (35.8)		
	1501 - 1750	24 (21.1)	21 (19.3)		
	1751 - 2000	13 (11.4)	15 (13.8)		
	2001 - 2250	06 (5.3)	4 (3.7)		
Order of birth	One (1)	65 (57)	60 (55)	2.306	0.805
	Two (2)	30 (26.3)	29 (26.6)		
	Three(3)	16 (14)	16 (14.7)		
	Four (4)	3 (2.6)	2 (1.8)		
	Five (5) and above	0 (0)	2 (1.8)		

Table 1 explains that the distribution of preterm neonates according to demographic characteristics is not statistically significant (p>0.05) across groups.

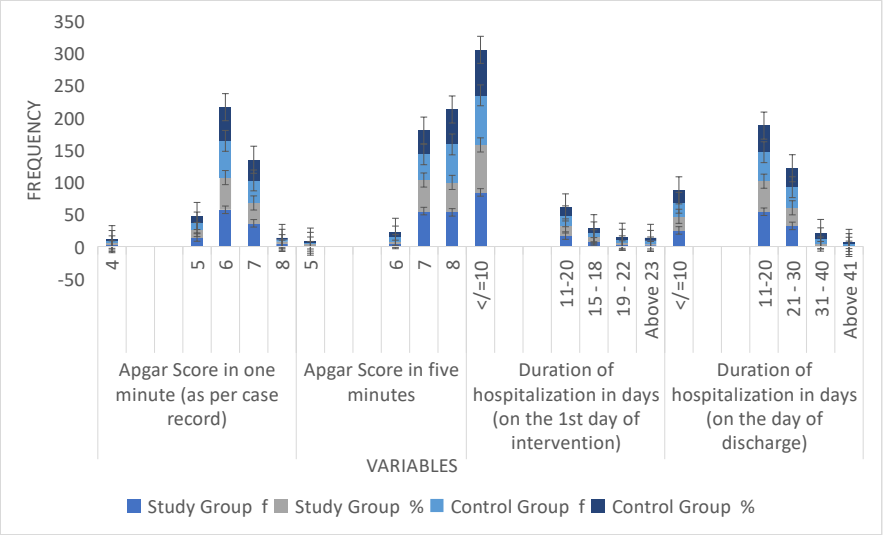

Figure 2. Characteristics of Preterm Neonates

Majority of preterm neonates in both groups had 11–20 days of hospital stay. Figure 2 has shown the number of preterm neonates who stayed in the hospital for more than 30 days was less (3) in the study group compared to the control group (11).

Table 2 Factors associated with Feeding during Five (5) days of Intervention

Variable	Distribution	N	Study Group F (%)	N	Control Group F (%)	χ^2	p
No. of days on intravenous line during intervention	0	114	101(88.6)	109	92 (84.4)	3.989	0.263
	1		1 (0.9)		3 (2.8)		
	2		12 (10.5)		12 (11.0)		
	3		0 (0)		2 (1.8)		
Amount of feed ml/kg/day prescribed on the day of randomization/ 1st day of intervention	20-60	107	60 (56.1)	90	52 (57.8)	3.940	0.268
	>60-100		39 (36.4)		28 (31.1)		
	>100-140		6 (5.6)		10 (11.1)		
	>140-180		2 (1.9)		0 (0)		
Amount of feed ml/kg/day prescribed on the 5th day of intervention	20-60	107	15 (14)	90	38 (42.2)	22.421	**0.000**
	>60-100		59 (55.1)		39 (43.3)		
	>100-140		26 (24.4)		12 (13.3)		
	>140-180		7 (6.5)		1 (1.1)		
No. of episodes of vomiting in first two days	Nil	107	57 (53.3)	90	49 (54.4)	3.864	0.342
	One (1)		27 (25.2)		23 (25.6)		
	Two (2)		16 (15)		13 (14.4)		
	Four (4) and above		7 (6.5)		5 (5.6)		

Table 2 describes that there was statistically no significant difference (p>0.05) between the groups regarding days on an intravenous line. The p-value of 0.268 suggests no significant difference between the groups in the amount of feed prescribed on the first day. The majority (57%) of the study group had no vomiting episodes, while others experienced varying numbers of episodes.

Table 3. Mean, SD, and difference of abdominal circumference during hospitalization

Time	Abdominal O'ce (cm)			Difference in abdominal O'ce (cm)			t-value	P-value	Effect Size
	N	Mean	SD	N	Mean	SD			
Study Group (Left lateral position after feeding)	108	24.4	1.60	98	1.04	0.79	2.48	**0.014**	**0.352**
Control Group (Any other recommended position after feeding)	104	24.3	1.70	94	0.7	1.11			

Table 3 depicts that the difference in abdominal circumference in the study group was statistically significant (p<0.05). The effect size for differences was 0.352, which is a medium effect.

Table 4. Comparison of Preterm neonates on feeding tolerance measured by abdominal circumference during Intervention

Group	Difference in Abdominal O'ce (cm)	Day 1		Day 2		Day 3		Day 4		Day 5	
		N	F(%)	N	F(%)	N	F(%)	N	F(%)	N	F(%)
Study	**<0.6**	109	38(34.9)	108	20(18.5)	103	14(13.6)	109	14(12.8)	109	18(16.5)
	0.6-0.9		44(40.3)		43(39.8)		29(28.1)		24(22)		20(18.3)
	≥0.9		27(24.8)		45(41.7)		60(58.3)		71(65.2)		71(65.2)
Control	**<0.6**	104	66(63.4)	108	68(63)	104	55(52.9)	103	55(53.4)	102	54(52.9)
	0.6-0.9		24(23.1)		34(31.5)		29(27.9)		40(38.8)		39(38.2)
	≥0.9		14(13.5)		6(5.5)		20(19.2)		8(7.8)		9(9.9)
Chi-square		17.435		57.057		44.359		78.496		72.016	
P value		**0.000**		**0.000**		**0.000**		**0.000**		**0.000**	

Table 4 denotes that the number of preterm in the study group with >0.9 cm of difference in abdominal circumference, increased gradually from 1st to 5th day from 27 to 71 (24.8% to 65.1%) than the control group. A higher number of preterm neonates in the control group were recorded with a difference of <0.6cm in abdominal circumference during the intervention.

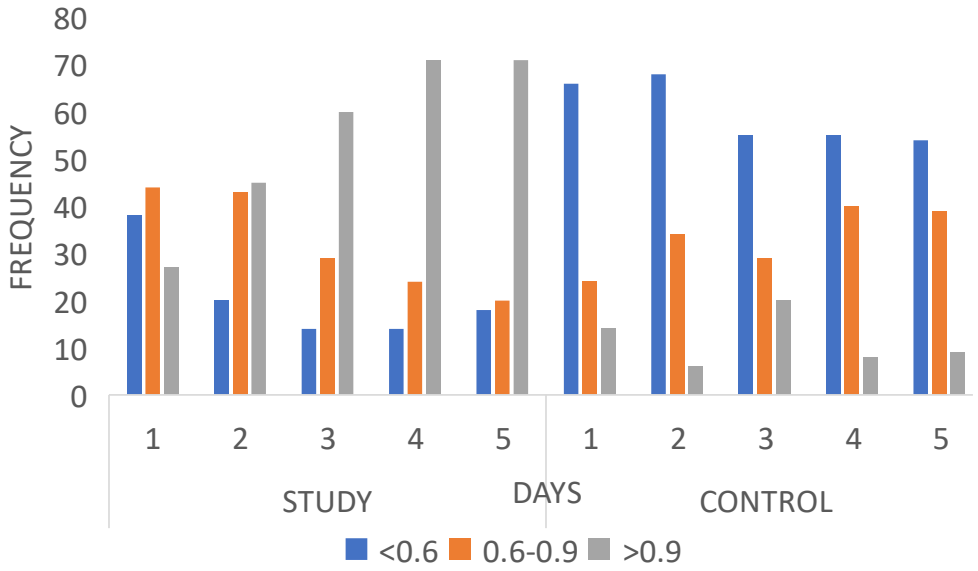

Figure 3. The difference in the abdominal circumference between the groups

The preterm neonate in the study group had a larger difference of abdominal circumference, which reflects feeding tolerance and more gastric emptying than in the control group as shown in the figure 3.

Table 5. Association between left lateral position after feeding and weight gain during five days intervention

* Mean differences for weight gain across groups **t = 2.1; p = 0.033**

It was noted from **Table 5**that there was a statistically significant association (p<0.05) between the difference in the abdominal circumference among preterm neonates placed in the left lateral position after feeding and weight gain during the intervention period.

Group	Mean of Abdominal circumference before feeding on the day of randomization	Mean weight gain (kgs)*	Category of difference in abdominal O'ce in cm	Weight gain in kgs during intervention			Chi square	P value
				N	<0.040 F(%)	>0.040 F(%)		
Study (Left lateral position after feeding)	**N= 114** 24.276 (SD=1.8411)	0.043±0.081	**<0.6**	7	5 (71.4)	2(28.6)	7.04	**0.030**
			0.6-0.9	34	17(50)	17(50)		
			>0.9	55	16(29.1)	39(70.9		
	t= 0.346, p=0.730	**Total**		96	38	58		
Control (Any other recommended position after feeding)	**N= 112** 24.189± 1.9427)	0.020± 0.078	**<0.6**	54	34(63.0)	20(37.0)	0.701	0.704
			0.6-0.9	33	20(60.6)	13(39.4)		
			>0.9	5	4(80.0)	1(20.0)		
	t= 0.346, p=0.730	**Total**		92	58	34		

Table 6. Association between left lateral position after feeding and weight gain at 2nd and 4th week follow-up

Table 6 shows that the preterm neonates placed in post-feed left lateral position during the intervention period had shown the same trends in weight gain during follow-up in the 2nd & 4th week, and the association was statistically significant (p<0.001)

Group	Category of difference in abd. O'ce (cm)	Weight gain in grams during 2nd week follow up			Chi-square	P value	Weight gain in grams during 4th week follow up				Chi-square	P value
		N	<400 F(%)	>400 F(%)			N	<400 F(%)	400-800 F(%)	>800 F(%)		
Study (Left lateral position after feeding)	**<0.6**	95	5(71.4)	2(28.6)	14.036	**0.001**	92	0	2(28.6)	5(71.4)	21.190	**0.000**
	0.6-0.9		23(67.6)	11(32.4)				3(3.3)	12(35.3)	16(55.9)		
	>0.9		27(50)	27(50)				1(2)	14(27.5)	36(70.6)		
Control (Any position after feeding)	**<0.6**	83	41(80.4)	10(19.6)			81	10(20)	29(58)	11(22)		
	0.6-0.9		26(89.7)	3(10.3)				6(20.7)	17(58.6)	620.7)		
	>0.9		2(66.7)	1(33.3)				1(50)	0	1(50)		

3. LIMITATIONS

The sample was dropped when two consecutive readings were missing and when discharged after three days of intervention.

Summary: The distribution of preterm neonates according to demographic characteristics, amount of feed prescribed on the first day, and days on an intravenous line has no statistical significance (p>0.05). Most (57%) in the study group had no vomiting episodes. There was a significant difference (p=0.000) in the feed prescribed on the fifth day. The mean difference in abdominal circumference in the study group was 1.04 cm and 0.7cm in the control group. The difference in abdominal circumference in the study group with post-feed left lateral position was statistically significant (p<0.05). The number of preterm in the study group with a difference>0.9cm of abdominal circumference increased gradually from day 1 to day 5 from 27 to 71 (24.8% to 65.1%) compared to the control group.

4. DISCUSSION

This was one of India's few randomized control trial studies on 223 preterm neonates. The present study revealed high statistical significance (p<0.001) on feeding tolerance among preterm neonates placed in the left lateral position after feeding. A few characteristics of preterm babies, like gestation age, birth weight, Apgar score, and days of hospitalization, were similar to the results of a study conducted by Kurvatteppa Halemani et al [13] and Khatony A. et al [1]. The mean of the days between admission and the day of randomization was 7.42 (SD=5.204) in study group and 8.04 (SD= 5.974) in control group and was not statistically significant (p>0.05). Age at discharge was varying between <10 days to >41 days. It was noted that the number of preterm neonates who stayed in the hospital for more than 30 days was comparatively reduced in the study group to three (3). In the study, most preterm patients had zero days on an intravenous line (88.6%) and the control group (84.4%). Both groups were similarly distributed towards the amount of feed prescribed on the first day, with the majority of the control group (57.8%) and the study group (56.1%) in the 20-60 ml/kg/day range. There was a significant shift by the 5th day from 20-60 to >60-100 ml/kg/day in the study group (55.1%) compared to the control group (43.3%) and>100-140 ml/kg/day in the study group (24.4%) compared to the control group (13.3%) respectively. The p= 0.000 is statistically significant in the study group towards feed amount on the 5th day. Data showed that 57% of the study group had no vomiting episodes, while others experienced varying numbers of episodes.

It was noted in both groups that the difference in abdominal circumference between preterm infants after feeding and before feeding was ≤ 2cm. The mean of abdominal circumference before feeding on the day of randomization was 24.276 (SD= 1.84) in the study group and 24.189 (SD=1. 94) in the control group, and there was no statistical significance (p>0.05).

The difference in abdominal circumference between after feeding and before feeding was distributed into three categories per analysis, i.e., <0.6cm, 0.6 cm–0.9 cm, and >0.9cm, as the majority of readings were falling in these categories. If the difference between post-feed and pre-feed abdominal circumference was more than 0.9 cm, it was considered more gastric emptying and well-tolerated feed. The results of the present study indicated that most preterm neonates placed in the left lateral position after feeding had more gastric emptying by the next feeding within a two-hour schedule. The difference in abdominal circumference after and before feeding in the study group was statistically significant (p<0.05). The effect size for differences was 0.352, which is a medium effect. The number of preterm neonates in the study group with a difference

>0.9cm in abdominal circumference increased gradually from day 1 to day 5 from 27 to 71 (24.8%–65.1%) compared to the control group. The significant differences in feed amounts on the 5th day indicated an impact of the intervention on feeding tolerance.

The results of the current study were supported by the findings of a cross-over experimental research design by Noha Mohamed Arafa et al. on the effect of developmentally supportive post-feeding positions on gastrointestinal feeding tolerance among preterm infants, which concluded that placing preterm infants in developmentally supportive right lateral, left lateral, and semi-recumbent post-feeding positions would reduce gastric residual volume and improve signs of gastrointestinal feeding tolerance [23]. In another study by Emriye Hilal Yayan et al. on how the post-feeding position affects gastric residue in preterm infants, the lowest mean gastric residue level was observed in the correct lateral position at 30 minutes. The prone position showed the lowest mean gastric residue level, followed by the right lateral, supine, and left lateral position at 120 minutes. The final measurements were taken at 180 minutes, with the right lateral position showing the lowest mean gastric residue level. Significant differences were found between the right lateral and left lateral positions and between the left lateral and prone positions [19]. Kaur, Kaur, and Saini concluded that the left lateral position was associated with higher but clinically non-significant pre-feed gastric residuals than the right lateral position [18]. Hence, it can be interpreted that keeping the preterm in the left lateral position after feeding would facilitate more gastric emptying and feeding tolerance as the difference in the abdominal circumference was statistically significant ($p<0.001$).

The weight of the preterm neonates in both groups was measured and documented over time, i.e., at birth as per the case sheet, at the time of randomization, on the last day of intervention, and at two and four weeks after discharge. The mean weight gain among the preterm neonates with post-feed left lateral position during five days of the intervention period was 0.0432 kgs (43.2 grams). In contrast, it was 0.020 kgs (20 grams) in the control group, showing significant weight gain among study group subjects. In the study group (n = 96), 39 preterm neonates gained >40g weight during intervention with >0.9 cm difference in abdominal circumference, whereas in the control group (n=94), there was only one preterm. More preterm neonates with post-feed left lateral position who had >0.9cm of difference in the abdominal circumference during five days of the intervention period had shown a trend in weight gain >400g at the 2nd-week follow-up and >800g at the 4th-week follow-up compared to preterm infants in the control group who were placed in other recommended position after feeding. Significant statistical association ($p<0.05$) between the difference in the abdominal circumference with post-feed left lateral position and weight gain during five days of intervention. Though the weight gain among study subjects during follow-ups cannot be attributed to post-feeding left lateral position alone, the same trends were noted in the weight gain. No studies regarding weight gain in the post-feeding left lateral position were found relevant to this study.

5. CONCLUSION

The preterm placed in the post feeding left lateral position showed more gastric emptying, feeding tolerance, and reported weight gain during the intervention, and the same trends were noted in the weight gain during follow-up.

Acknowledgments: We are thankful to every volunteer who participated and supported our study. We are also very much thankful to our institute for supporting us in conducting this study through proper approvals and permissions.

Conflicts of Interest:

Authors declare none

REFERENCES

[1] Alireza. Khatony, et.al., 2019. The effects of position on gastric residual volume of premature infants in the NICU. Italian Journal of Pediatrics 45(6): 5-8.

[2] Naveen Bajaj, et.al., 2022,Feeding in Preterm and Feed Intolerance, Indian Academy of Pediatrics (IAP) Standard Treatment Guidelines 98

[3] Priyali Prakash, India recorded the maximum preterm births in 2020: findings of the WHO report. May 13, 2023. https://www.thehindu.com/sci-tech/health/article66838513.ece

[4] The wire staff, https://thewire.in/health/in 2023

[5] World Health Organization: Preterm Birth at who.int/newsroom/preterm birth, 2018.

[6] National Health Portal of India, Preterm Birth 2018. atnhp. gov.in/ disease/ reproductivesystem/female/preterm birth

[7] Brigit M. Carter. 2012. Feeding Intolerance in Preterm Infants and standard of Care Guidelines for Nursing Assessments.. Newborn & Infant Nursing Reviews. 2012;12(4):187-201.

[8] Moore TA, et.al., 2013. Relations between feeding intolerance and stress biomarkers in preterm infants. Journal of Pediatric Gastroenterology and Nutrition 57(3):356-62.

[9] Sangers, H., et.al., 2017. Outcomes of gastric residuals whilst feeding preterm infants in various body positions. Journal of Neonatal Nursing. 19 (6):337–41.

[10] Cui,X., et.al., 2019. Effects of Lactobacillus reuteri DSM 17938 in preterm infants: a double-blinded randomized controlled study. Italian Journal of Pediatrics, 45: 140. doi: 10.1186/s13052-019-0716-9.

[11] Gianni, et. al., 2016. Does parental involvement affect the development of feeding skills in preterm infants? a prospective study. Early Human Development, 103, 123–128. https://doi. org/ 10. 1016/j.earlhumdev.2016.08.006

[12] Yasuda H., et al. 2021. Monitoring of gastric residual volume during enteral nutrition Cochrane Database Syst Rev 9:CD013335

[13] Kurvatteppa Halemani, et.al., 2023. Efficacy of body position on gastric residual in preterm infants: a systematic review and meta-analysis Clinical and Experimental Pediatrics. 66(6):262-270. https://adoi.org/10.3345/cep.2021.01508

[14] https://newbornwhocc.org. 2019. Feeding of Low Birth Weight Infants- AIIMS Protocols in Neonatology. Noble Vision Publishers, Delhi. Chapter 21: Volume 3. 336,337

[15] Shiv Prasad Dubey, et.al., 2018. Pre-Feed Aspirates vs. Abdominal Girth Monitoring for Detection of Feed Intolerance in VLBW Babies Indian Journal of Neonatal Medicine and Research Vol-6(2):PO06-PO12 DOI: 10.7860/IJNMR/2018/35573.2229

[16] Duygu Gözen, Zeynep Erkut P, Rabia Uslubaş, 2022, Effect of different positions on gastric residuals in preterm infants initiating full enteral feeding. https://doi.org/10.1002/ncp.10789

[17] Hoda Ahmed Mahmoud, Samah Hamdy Abdelhafeiz. 2021. Effect of Right Position During and After Feeding on Gastric Residual Volume and Regurgitation Episodes Among Preterm Infants. Egyptian Journal of Health Care, EJH Vol. 12 No. 3

[18] Kaur, V., Kaur, R., and Saini, S. 2018. Comparison of three nursing positions for reducing gastric residuals in preterm neonates: A Randomized Crossover Trial. Indian Pediatrics. 55(7):568-572.

[19] Emriye Hilal Yayan, et.al., 2018. Does the post-feeding position affect gastric residue in preterm infants? Breastfeeding medicine Vol. 13. No.6 438-443. doi: 10.1089/bfm.2018.0028

[20] Cheraghi, F., et.al., 2018. The effect of nesting placement position on the gastric residual volume after gavage for premature neonates hospitalized in the neonatal intensive care unit (NICU). Jmsc research. 9(35):2455-65.

[21] Ameri,G.F., et.al., The effect of the prone position on gastric residuals in preterm infants 2018. Journal of Pharmaceutical Research International; 2018. ISSN: 2456-9119. 22 (2): 1-6. Doi: 10. 9734/JPRI/2018/40433.

[22] Malhotra AK, et.al., 1992. Gastric residuals in preterm babies. J Trop Pediatr. 38(5):262-64.

[23] Noha Mohamed Arafa, et.al., 2022, Effect of developmentally supportive post-feeding positions on gastrointestinal feeding tolerance among preterm neonates. Egyptian Journal of Health Care, EJHC Vol. 13. No.