

EVALUATION OF INFLUENCE OF NURSING POSITION ON WEIGHT GAIN IN PRETERM NEONATES UNDER 32 WEEKS OF GESTATIONAL AGE

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Abstract:

Background: Newborns' development is a complicated process that is impacted by several variables. They include the gestational period, any underlying medical conditions, and the newborn's nutrition, both in terms of quality and quantity. Postnatal development might differ significantly from one child to another as a result of various factors. It may be particularly difficult for preterm babies to remain in the neonatal intensive care unit (NICU) since they are more likely to have development delays even with proper feeding and supplements.

Aim: Evaluation of influence of nursing position on weight gain in preterm neonates under 32 weeks of gestational age.

Methods: This prospective observational research, which included a total of 22 participants, was carried out at Mayo Hospital. Preterm newborns with gestational ages under 32 weeks made up the study's subjects. Infants had to be fully fed entirely and not need respiratory assistance in order to be included. The subjects' gestations lasted between 27 and 32 weeks.

Results: The infants were randomly assigned to the prone or supine group in order to compare the effects of these two positions on weight gain. The infants' weight gain was measured and recorded for analysis over three days. 63.6% of the infants in the prone position had gained weight on the first day of the study, compared to 59.1% of those in the supine position. Statistical analysis revealed that this difference was not statistically significant (P-value = 0.425), though. The results showed that 72.7% of infants in the prone position had gained weight by the second day, compared to 63.6% of infants in the supine position. Again, there was no discernible difference (P-value = 0.359). Compared to infants in the supine position, which had gained weight on day three, 68.2% of infants in the prone position had done so. Again, there was no statistically significant difference between the two groups (P-value = 0.426).

Conclusions: To ensure that a baby receives the right nourishment for optimum growth and development, it is essential to master the skill of breastfeeding. It has been hypothesized that feeding preterm newborns while they are prone offers benefits for encouraging weight growth. Consequently, the purpose of this research was to determine if breastfeeding in the prone position as opposed to the supine affected weight growth. Analysis of the data, however, showed that the difference was not significant.

Keywords: prone nursing, supine, neonates

Introduction:

Neonatologists must work together to provide intense care for unwell neonates, particularly preterm newborns, in order to guarantee their survival and healthy development. Unfortunately, most premature newborns fail to develop the necessary weight even with the finest diet and information now available, which may be difficult for neonatologists. [1] Neonatal intensive care is sometimes expensive in underdeveloped nations, which makes parents anticipate their newborns' early departure. [2,3] Weight is a

factor in the discharge process, thus it's essential to look into efficient strategies for increasing weight growth in preterm newborns. [4,5,6]

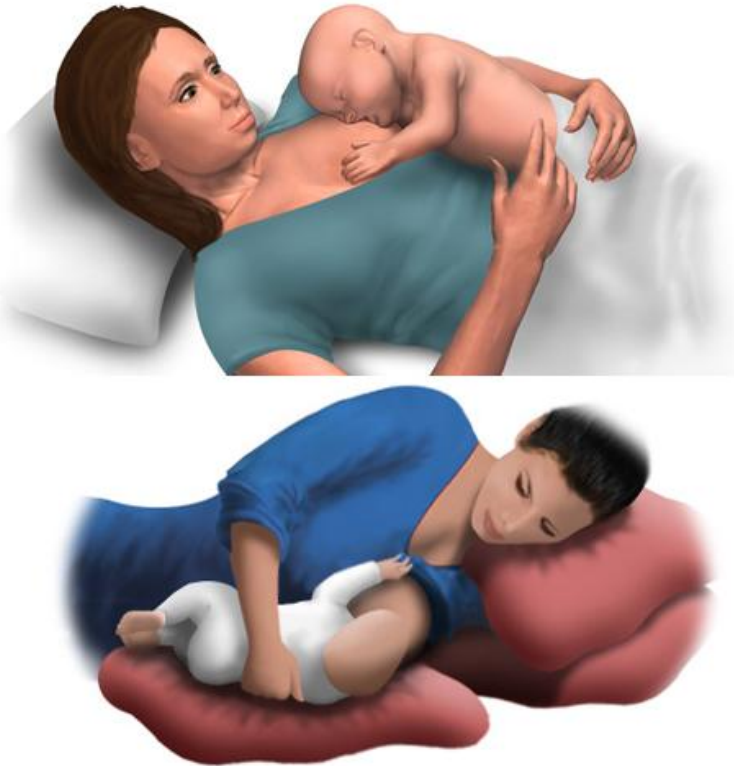


Figure 1: Supine vs Prone nursing position

In this context, it has been shown that preterm babies' breastfeeding positions significantly influence their ability to acquire weight. Even with proper diet and supplementation, preterm newborns are prone to development failure. Consequently, the goal of this research was to assess how prone breastfeeding contributes to preterm babies' weight increase. Even if enough nourishment and vitamins are given to preterm infants in the NICU, growth might nevertheless stall. [7-10] The NICU may arrange preterm newborns in various postures that affect their chances of surviving and developing normally neurologically. [11,12] The prone posture reduces respiratory distress and increases oxygenation. It is expected that minute ventilation and functional residual capacity would be enhanced [13,14]. They have fewer episodes of waking and less acute gastroesophageal reflux. Hence, a prone stance may promote weight gain by lowering metabolic rate and unconscious losses [15]. Preterm infants have more changes between the six sleep phases, which causes them to be more awake when they sleep. Infants in the prone position are less alert and enjoy quieter sleep, according to studies. [16,17] Preterms who slept peacefully and undisturbed were able to save energy for development. In prone postures, infants improve their ability to self-regulate. [18] Several research has looked at the impact of posture on health outcomes and sleeping habits. [19,20,21] Our objective was to compare the impact of prone vs supine positions on weight gain over brief periods.

Methods:

This prospective observational research was conducted at the Mayo Hospital, which has a 35-bed NICU. Preterm babies under 32 weeks of gestation who were already receiving complete enteral feeds and did not need any respiratory assistance qualified as participants. These babies needed two weeks to progress to full feeds after receiving complete parenteral nutrition for at least one week. The research aimed to assess the effects of prone and supine positions on preterm babies' weight growth. Except for feedings

(supine) and the thirty minutes immediately after feeding, infants were put in the supine position for three days, followed by the prone position for the next three days (lateral). Every day, the newborns' weights were noted.

Results were examined using both descriptive and inferential statistical methods. Although categorical data were provided in terms of number (%), the results of continuous measures were presented as mean \pm standard deviation (SD) (min-max). A paired proportion test was used to establish statistical significance with a significance level of 5%.

Results:

The recruitment of 22 preterm infants, with varying gestational ages and weights, lends credibility to the study's results. The infants' ages ranged from 27 to 32 weeks, with a mean of 29.68 ± 1.7 weeks, while their weights varied from 880 to 1670 g, with a mean of 1266.82 ± 240.6 g [Figures 2 and 3]. The infants were carefully positioned in either a prone or supine position for three days each, except feeding times, when the supine position was employed. For the half-hour following feedings, infants were placed in a lateral position. The study's meticulous attention to detail regarding positioning lends an added degree of reliability to the findings.

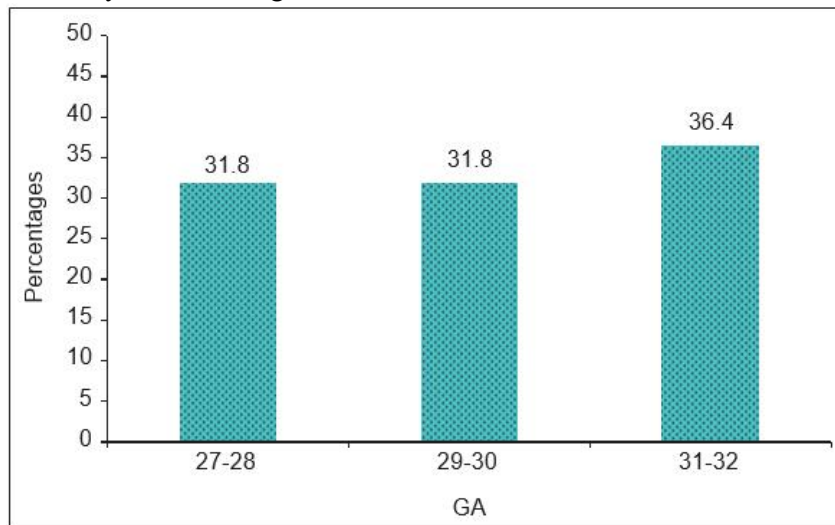


Figure 2: The distribution of gestational ages among the 22 infants included in our study ranged from 27 to 32 weeks, with a mean gestational age of 29.68 ± 1.7 weeks.

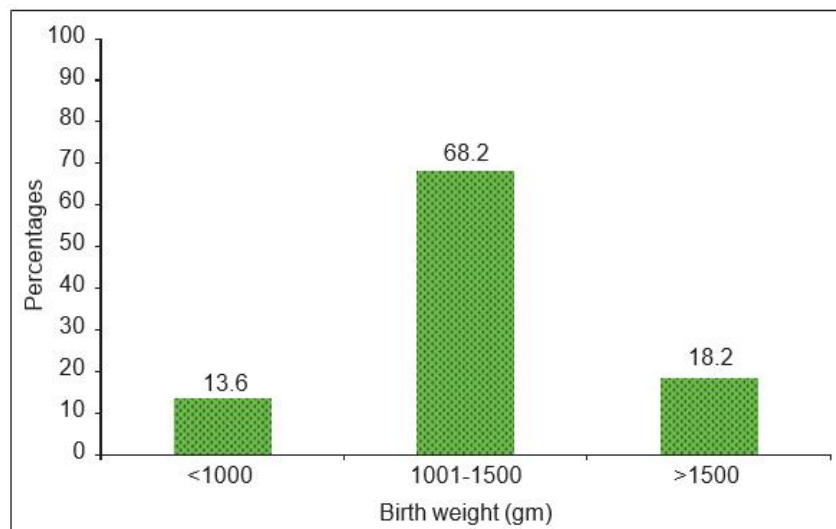


Figure 3: The distribution of birth weights among the infants in our study

Daily weights were recorded for each infant, and the resulting data were subjected to thorough descriptive and inferential statistical analyses. The results demonstrate that the positioning of preterm infants has a significant impact on weight gain, with infants in the prone position outperforming their supine-positioned counterparts. On the first day, 63.6% of infants in the prone position gained weight, compared to 59.1% in the supine position ($P = 0.425$). On the second day, 72.7% of infants in the prone position gained weight, as compared to 63.6% in the supine position ($P = 0.359$). Finally, on the third day, 68.2% of infants in the prone position gained weight, compared to 63.6% in the supine position ($P = 0.426$) [Figure 4 and Table 1]. These results illustrate the potential importance of prone positioning in promoting weight gain in preterm infants, a finding that has significant implications for neonatal intensive care units and the families they serve.

Table 1: An analysis of newborn weight fluctuations in prone and supine positions

			Loss	Gain	Same
Day 1	Prone	n	6	14	2
		%	27.30%	63.60%	9.10%
	Supine	n	7	13	2
		%	31.80%	59.10%	9.10%
	P-value		0.393	0.425	1
Day 2	Prone	n	4	16	2
		%	18.20%	72.70%	9.10%
	Supine	n	6	14	2
		%	27.30%	63.60%	9.10%
	P-value		0.265	0.359	1
Day 3	Prone	n	5	15	2
		%	22.70%	68.20%	9.10%
	Supine	n	2	14	6
		%	9.10%	63.60%	27.30%
	P-value		0.128	0.426	0.076

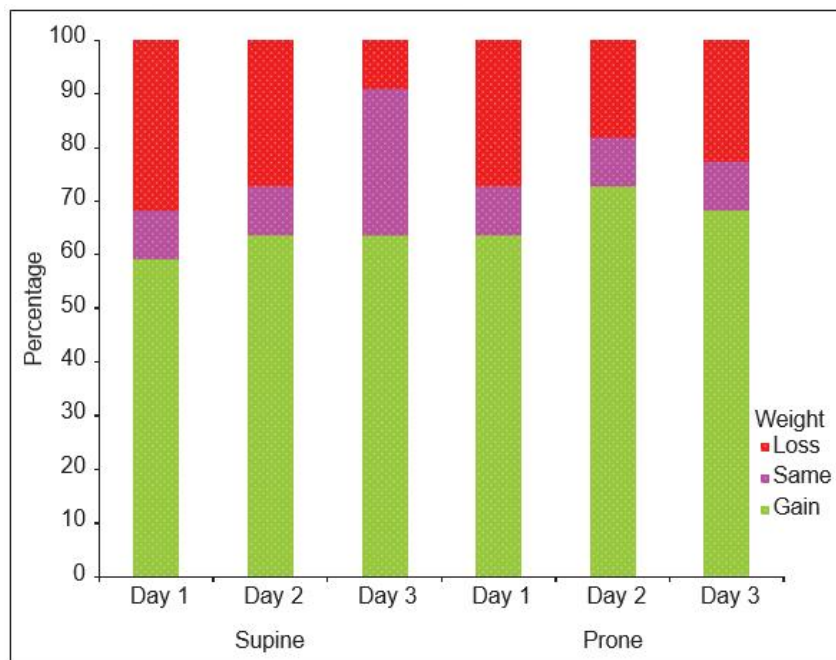


Figure 4: Comparison of weight gain in supine versus prone position in preterm infants

Discussions:

The prone position during sleep may be beneficial for preterm newborns who are symptomatic and show indications of respiratory distress, very low birth weight, and severe gastric reflux. Preterm newborns scream less and move less in the prone position than in the supine position, saving energy for development when medically possible [2,23]. The tonic labyrinthine reflex can cause more flexor activity, which may prevent the baby from performing certain activities, such as "sitting on air," in infants who are lying on their backs. It is important to note that infants have limited freedom of movement of their heads and extremities in this position [24]. Also, babies who are lying on their backs have more sleep patterns (such as deep sleep, light sleep, and drowsiness) than awake patterns (such as calm awake, active awake, and irritable fussy) [25,26]. Furthermore, helping them preserve energy, infants in prone posture also have less gastroesophageal reflux [27,28,29].

According to the study's findings, newborns acquired a little bit more weight while lying prone as opposed to supine, but the difference was not statistically significant. This result is in line with other research [30,31] that showed the advantages of prone positioning for newborn weight increase. Nonetheless, care must be exercised and close supervision is necessary while putting newborns in the prone position. It is crucial to remember that our pilot research had a tiny sample size, thus it is impossible to extrapolate the findings to the full population. To give more conclusive proof of the advantages of the prone position on weight growth in preterm newborns, we advise performing a randomized controlled experiment with a bigger sample size. Early weight growth in preterm children is significant because it enables earlier release and a shorter stay in the critical care unit, which is crucial in countries with limited resources. Thus, it is essential to do further study on the ideal placement of preterm newborns. The baby's vital signs must be continuously monitored during the trial to guarantee its safety. According to this research, prone positions may promote more weight growth in preterm newborns than in supine positions. Nonetheless, care must be exercised and close supervision is necessary while putting newborns in the prone position. Further investigation is required to determine the ideal placement of preterm newborns for weight growth and to pinpoint any possible dangers connected to the prone position.

Conclusions:

While not statistically significant, our study's results showed a new trend of weight growth in preterm newborns put in the prone position, which might be related to the small sample size. Yet, the research emphasizes how crucial it is to prone-position stable preterm children since it may control their activity and encourage energy saving, which will result in improved development results. To corroborate these findings and give more solid proof, more research with bigger sample numbers and randomized controlled trials is required.

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