

Effect of Tactile-Kinesthetic Stimulation on Weight in Preterm Neonates in Neonatal Intensive Care Unit

This study evaluated the efficacy of tactile kinesthetic stimulation on the weight of 40 preterm (28 weeks to <37 weeks) infants. Experimental group received two sessions per day of tactile-kinesthetic stimulation, for 10 consecutive days along with routine hospital care (RHC) and control group received only RHC. Increase in mean (SD) weight gain was significantly higher in the experimental group as compared to control group [10.79 (0.62) g vs 4.03 (0.89) g; $P < 0.001$].

Keywords: *Developmental care, Exercise, Growth, Massage.*

Premature infants are exposed to a stressful environment, high intensity noise, and bright light continuously. They are deprived of mechanosensory stimulation which they receive in utero [1], constant tactile stimulus of amniotic fluid, and are also exposed to various touch stimulus during routine care [2]. Massage therapy may help in facilitating weight-gain process. We studied the efficacy of tactile- kinesthetic stimulation on the weight of infants in a neonatal intensive care unit (NICU).

This study was conducted in a level III neonatal unit from May, 2019 to August, 2019, after ethical clearance from the institutional ethics committee. All infants born between 28 weeks to <37 weeks gestational age, and birthweight of 1000 g - 2500 g and admitted in the NICU within the first 48 hours were enrolled. Additional inclusion criteria were: Apgar score >7 at 1 and 5 minute with no resuscitation required at birth, and medically stable with medical conditions primarily related to immaturity (such as elevated bilirubin, mild hypoglycemia and hypocalcemia). Those with genetic anomalies, congenital anomalies, any infections, and any evidence of intraventricular hemorrhage were excluded. Enrolled infants were randomized by using computer-generated random numbers to receive tactile-kinesthetic stimulation and routine hospital care (RHC) after 48 hours of their birth. Experimental group infants received two sessions of tactile-kinesthetic stimulation for 10 minutes each day, for ten consecutive days along with RHC, whereas the infants in the control group received only RHC.

The stimulation protocol was taken from field study in 1986 [4]. For the tactile stimulation, the infant was placed in a prone position. The researcher used the palms of the scrubbed and warmed hands on the infant's body while the baby was in the incubator. The following five regions of the infant's body were then gently stroked for five seconds, 12 times consecutively (totalling one minute). From the top of the neonate's forehead down the side of the face to the neck and back to the forehead; from back of the neck across the shoulders and back to the neck; from the upper back down to the waist and back up; from the thighs down to the ankles and back to the thighs; and from the shoulders to the wrists and back to the shoulders. For

the kinesthetic and proprioceptive stimulation, the infant was placed in supine position. This stimulation was given for five minutes with five one-minute intervals. It included six passive flexion and extension movements in the right and left arm, the right and left leg and the two legs together.

The weight of the babies from both the groups were measured daily by digital electronic weighing scale by the same nursing assistant who was blinded about the allocation of groups. The outcome of this study was the weight of infants in the two groups after 10 days of intervention.

A total of 46 preterm babies were enrolled and forty infants completed the study. Both the groups did not differ on the matched variables of gestational age, birthweight, weight on day one of the study, and 1 and 5 minute Apgar scores (**Table I**). The mean (SD) fluid and calorie intake in the infants of the two groups was also similar. The mean (SD) weight gain after 10 days was higher in the experimental group as compared to control group [10.79 (0.62) g vs 4.03 (0.89) g; $P < 0.001$] (**Table I**).

The present study assessed the effect of tactile-kinesthetic stimulation on weight of preterm infants and found a significant positive effect on weight gain in the experimental group. Small sample size due to time constraints, recruitment from a single centre, and exclusion of the factors which influence the energy expenditure of the infants, were the major limitations of this study.

White-Traut RC, *et al.* [5] and Mathai, *et al.* [6] had demonstrated the same benefit, when massage was combined with kinesthetic stimulation or physical activity. Along with weight gain, vagal tone and gastric motility [7], and bone mineralization and skeletal growth are also reported to improve [8-10]. Our findings provide further evidence that tactile kinesthetic stimulation improves weight gain in stable preterm infants.

In conclusion, tactile- kinesthetic stimulation for preterm infants between 28 to <37 weeks of gestational age had significant effect on weight gain. Further clinical studies with larger sample size to confirm the result obtained in our study and to standardize the protocol are the need of the hour.

Table I Baseline Characteristics and Outcomes in Preterm Neonates Enrolled on the Study (N=40)

Variables	Experimental group (n=20)	Control group (n=20)
Gestational age, wk	33.8 (1.8)	33.4 (1.5)
Birthweight, g	1848.7 (226.3)	1830.8 (234.1)
1-minute Apgar score	7 (0)	7 (0)
5-minute Apgar score	8 (0)	8 (0.5)
Baseline weight, g	1809.5 (208.1)	1779.1 (142.6)
Weight gain day 1-5, g	77.9 (35.09)	79.6 (49.1)
*Weight gain day 6-11, g	53.9 (3.9)	20.1 (4.5)
*Daily weight gain, g	10.8 (0.6)	4.03 (0.9)

All values in median (IQR) except weight gain in mean (SD); * $P < 0.001$.

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Lipid Profile in Children With Thalassemia: A Prospective Observational Study From Eastern India

This was a prospective observational study to evaluate abnormalities in lipid profile in 50 children with transfusion dependent thalassemia. Dyslipidemia characterized by high triglycerides, low high density lipoprotein (HDL), and high total cholesterol: HDL ratio was noted. These pro atherogenic risk factors may be lead to significant cardiovascular morbidity in these patients.

Keywords: *Atherosclerosis, Co-morbidity, E beta thalassemia, Outcome.*

Life expectancy and quality of life of beta-thalassemia patients have improved in recent years. However, non-siderotic complications are known to cause significant morbidity in these patients with beta-thalassemia. In recent years, many studies have shown risk of developing subclinical atherosclerosis in beta-thalassemia patients. Strong association of abnormal serum lipid levels [low total cholesterol (TC) and (high density lipoprotein) HDL-cholesterol, high triglycerides (TG) and TC: HDL ratio) with premature atherosclerosis have been noted in children with beta thalassemia [2-5]. Low HDL - cholesterol and

high TC:HDL ratio are pro-atherogenic factors, which help in cardiac risk stratification and prognostication [6,7]. Pediatric data regarding lipid profile in thalassemia is limited. Our primary objective was to evaluate abnormalities in lipid profile in children with thalassemia.

A prospective observational study was performed at Institute of Child Health, Kolkata between July, 2016 and June, 2017. Children with transfusion-dependent thalassemia, under regular follow up in our thalassemia clinic, were included for this study. The patients had been diagnosed following appropriate clinical history, physical examination, complete blood count and high performance liquid chromatography (HPLC) and were on regular transfusion and chelation therapy. Children having family history of dyslipidemia were excluded. None of the patients had previous history of cardiovascular illness. Fifty age- and sex-matched healthy children were taken as control. Ethical clearance was obtained from the institution ethics committee and written consent was obtained from care givers.

Blood samples for serum fasting lipid profile and ferritin were taken after a 12 hour overnight fast. Spectrophotometry was used for assessing fasting lipid profile. Statistical analyses were carried out using GraphPad Prism, version 5.0. Continuous, non-parametric data were compared using the Mann-Whitney U test, while categorical data were compared by chi square test. $P < 0.05$ was considered as statistically significant.

Out of a total of 53 eligible children, 3 were excluded for having family history of hyperlipidemia. Thus, 50 children