

Effect of Oil Massage on Changes in Weight and Neurobehavioural Response of Low Birth Weight Babies

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The transition from fetal to neonatal life represents one of the most dynamic and potentially hazardous events in human life cycle. Generally neonatal deaths contribute to a greater extent in infant mortality rate. Out of four million global neonatal deaths that occur annually, 98 percent happen in developing countries. This death takes place principally in Asia and Africa and remains unseen by health professionals. Hence reduction in neonatal mortality depends significantly on interventions which can be practiced at home. One of such health promotion activity is oil massage for infant.

For hundreds of years, some population particularly in India and Mediterranean region have routinely applied natural oils to the skin of new born baby by considering some benefits namely improvement of the skin barrier function, thermoregulation and positive effect on growth. However, oil massage is not routinely implemented in hospital settings. The reason may be the fears that touch may be aversive and painful stimuli to the newborn. This study was conducted in the year 2005-2006 to find out the potential benefits of oil massage on weight and neurobehavioural responses of low birth weight (LBW) babies.

Objectives

- To assess the effect of oil

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massage on weight of LBW babies.

- To assess the effect of oil massage on neurobehavioural responses of LBW babies.

- To determine the association between the effect of oil massage on LBW babies with selected variables.

The conceptual framework used for the study was based on Roy Adaptation Model explained by Sister Calista Roy in 1970's. With the help of this theory the mechanism of potential weight gain and neurobehavioural responses improvement after oil massage were evaluated.

Methodology

The research design was quasi experimental non-equivalent control group design. The study was conducted in neonatal intensive care unit (NICU) and obstetrics wards of St Johns Medical College Hospital, Bangalore. Using purposive sampling technique, 64 babies were selected for the study and they were randomly assigned to experimental (n=32) (coconut oil massage) and control (n=32) (no massage) group. Infants in the control group received routine nursing care. Infants in the experimental group received routine nursing care as well as 5 minutes of coconut oil massage twice a day (once in the morning and once in the evening) by occupational therapist. The oil massage was given for a period of 5 consecutive days.

The standardised weigh-

ing machine and neonatal intensive care unit network neurobehavioural scale (developed by Barry T Braselton, modified 2004) was used to assess the weight and neurobehavioural responses.

The neurobehavioural responses included were habituation, attention, arousal, regulation and handling, quality of movements, excitability, lethargy, non-optimal reflexes, asymmetric reflexes, hypotonicity, hyper tonicity and stress abstinence. Triple blinding method was used to avoid the bias from investigator, subjects and statistician.

Baseline data of the mother and baby were collected from the records. Collected data were analysed using both descriptive and inferential statistics namely mean, standard deviation (SD), student 't' test, chi-square values mixed model repeated measures ANOVA, Fishers exact probability and coefficient correlation.

Procedure for oil massage

Sessions began 30-45 min after a feed in the morning and evening. Infants in oil massage group received massage with 5 ml/kg/day of coconut oil divided equally between each of the applications. And if the baby started crying for passing urine or stools during the session, it was temporarily stopped till the baby was comfortable again. The procedure consisted of 3 phases.

Phase I: This was done in the

prone position. Four firm strokes with palms of the hands of 5 seconds each, were provided in three areas (a) head from forehead hairline over scalp down to neck with alternate hands; (b) neck from midline outwards with both hands simultaneously; (c) shoulders from midline outwards with both hands simultaneously; and (d) back from nape of neck down to buttocks with firm, long stroke with alternate hands.

Phase II: This was done in the supine position. Four firm strokes with palms of the hands, of 5 seconds each, were provided in each area (a) forehead - from midline, outwards with both hands simultaneously; (b) cheeks - from side of nose with both hands simultaneously in rotating and clockwise direction; (c) chest "butterfly" stroking from midline upwards, outwards, downwards and inwards back to initiating point; (d) abdomen - from the appendix, in a clock wise direction around ab-

domen avoiding the epigastrium and probes, with gentle strokes; (e) upper limbs (each separately) - from shoulders to wrist using alternate hands for stroking; (f) lower limbs (each separately) - from hips to ankles using alternate hands for stroking; (g) palms from wrist to finger tips using alternate hands for stroking; and (h) soles - from heel to toe tips using alternate hands for stroking.

Phase III: This was done in the supine position and consisted of passive flexion and extension movements of the limbs at each large joint (shoulder, elbow, hip, knee and ankle) as 5 events of 2 seconds each in each area.

During the massage infants were nursed naked, with a radiant warmer with skin mode of temperature control. They were kept uncovered in the cradles under radiant warmer on a polythene sheet for one hour. It was done to prevent oil being rubbing off. No oil was applied to the babies of control

group. Babies in both the groups received measured breast milk 80-100 ml/kg/day fed with a palladai or a gavages feed. All neonates were given calcium, phosphorus and vitamin supplements; mothers were allowed to touch and hold their infants as often as they wished in both the subgroups. Before discharge, both group mothers were trained and advised to continue oil massage twice daily in draught free room at home and limit the procedure to 5 min each.

Results

Table 1 shows that there has been no statistically significant difference at 0.05 level of significance for age sex, gestational age and Apgar 1. Though both the groups were not comparable with respect to birth weight, socio-economic status and Apgar 2 ($p > 0.05$), they were statistically controlled during analysis.

Table 2 shows that there was no significant change in

Table 1 : Comparability of groups according to baseline variables

(N=32+32)

S. No.	Variables	Experimental Group			Control Group			Test of Significance
		Range	Mean	SD	Range	Mean	SD	
1	Age	1-15 days	2.5	3.1	1-15 days	4.1	3.8	$t=1.84$, $df=62$
2	Sex							$\chi^2 = 0.06$ $df=1$
3	Gestational age	30-40 wks	36	2.2	30-39	35.2	2.2 wks	$t=1.40$, $df=62$
4	Apgar I	4-8	6.6	1.4	4-8	6.6	1.4	$t=1.67$, $df=62$
5	Apgar 2	6-9	8.0	5.7	6-9	8.0	1.0	$t=2.25$, $df=55.3$
6	Socio economic status	1-4	2.7	0.9	1-4	2.4	0.8	χ^2 not possible $t=1.13$, $df=62$
7	Low birth weight (kg)	1-2.9	2.1	0.4	1 - 2.9	1.9	0.4	$t= 2.52$, $df=62$

*No significant difference at 0.05 level of significance.

$t(62) = 2.00$, $X^2(1) = 3.84$ ($p < 0.05$).

Table 2: Change in weight of low birth weight babies in the two groups

(n= 32+32)

Parameter Weight	Experimental group			Control group			Test of Significance
	Range	Mean	SD	Range	Mean	SD	
1 st day	0.9 - 2.9	2.1	.4	1 - 2.4	1.8	.4	Group x time F=0.99
5 th day	1.3	2	.4	1 - 2.5	1.8	.4	df=1, 62

F(1,62)= 4.00, p>0.05

Table 3 : Neurobehavioural responses of babies in the two groups

Parameter	Experimental Group				Control Group			
	1st Day		5th Day		1st Day		5th Day	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Habituation	3.9	0.39	5.12	0.49	4.0	0.05	4.85	0.61
Attention	3.4	0.5	5.5	2.72	3.1	0.4	4.5	1.0
Arousal	3.7	0.5	3.6	0.3	3.6	0.5	3.5	0.4
Regulation	5.3	0.5	5.8	0.4	5.2	0.4	5.6	0.4
Handling	0.36	0.11	0.26	0.08	0.34	0.11	0.25	0.06
Movement	4.4	0.5	4.5	0.4	4.3	0.6	4.4	6.0
Excitability	3.0	1.5	2.4	1.2	2.8	1.6	2.0	1.3
Lethargy	6.0	2.2	3.1	0.6	7.4	3.0	4.2	1.8
Non-optimal reflexes	7.7	1.8	5.4	1.3	8.3	1.8	5.7	1.3
Asymmetric reflexes	0.43	0.56	0.34	0.48	0.46	0.71	0.31	0.53
Hypertonicity	0.93	0.29	0.34	0.48	0.40	0.55	0.46	1.79
Hypotonicity	2.6	1.0	2.5	1.0	2.7	9.0	2.4	9.0
Stress	1.0	0.02	0.1	0.02	0.09	0.02	0.1	0.02

weight in LBW babies in the two sub-groups. Since the data at baseline are not comparable, two-way mixed model repeated measures ANOVA was used. It compares the means of a single dependent variable between the groups as well as across the two points in time. Further, Table 2 reveals that there is no significant change in weight in experimental group because of oil massage ($0 > 0.05$).

Neurobehavioural responses of babies in experimental and control group were summarised according to NNNs scoring method. Table 3 compares the initial

and final scores of neurobehavioural responses. It shows that there is marginal improvement in mean in both the groups over 5-day period. Experimental group showed more improvement in attention and habituation ($p < 0.05$).

The study revealed that there was a significant difference in attention and habituation in experimental group at $p < 0.05$. Hence it is concluded that oil massage is effective in improving the neurobehavioural responses namely attention and habituation of LBW babies.

No significant difference was seen in weight and other

neurobehavioural responses of both experimental and control group. The reasons attributed to the present findings (in contrast to findings of similar study) were massage of shorter duration, heterogeneous nature of samples (preterm + small for gestational age babies) and physiological weight loss during the early neonatal period.

Some other studies done only on preterm babies to identify the effect of oil massage on weight and neurobehavioural responses proved to have statistically significant difference. Yet, as stated earlier, the present study included the preterm and small term for gestational age babies as samples of low birth weight babies.

Conclusion

Oil massage was found to be feasible, safe and cost effective. This study has important implications in nursing care, as nurses can teach parents while infant is hospitalised to initiate this simple, culturally acceptable, mother-focused and home-based programme to foster LBW infant development.

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