# Effectiveness of Oil Massage Therapy on Weight and Neurobehavioral Response among Low Birth Weight Infants

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Abstract: An interventional study was conducted to evaluate the effectiveness of oil massage therapy among low birth weight infant at Sri Ramakrishna Hospital, Coimbatore. Quasi experimental-nonequivalent control group design was adopted for this study. A sample of 14 infants were selected and assigned randomly to experimental and control group. The baseline data were collected from the infant's record, weight was assessed by electronic weighing scale and neurobehavioral response was assessed by Modified Brazelton's Neurobehavioral Assessment Scale for both experimental and control group. Coconut Oil massage was done for duration of 15 mins to infants in experimental group 3 times a day in 4 hours interval. Weight was assessed before and after the intervention and neurobehavioral response was assessed on the first and 10<sup>th</sup> day of intervention. Weight and neurobehavioral response of experimental group were compared with control group. The results reveal that there is a significant difference in weight and neurobehavioral response after the oil massage among infants in experimental group, when compared to the infant in control group

Keywords: low bith wt, weight gain, neurobehavioral responses, oil massage, low birth wt infants.

### 1. Introduction

Babies with a birth weight of less than 2.5 kg irrespective of the period of gestation are classified as low birth babies. These include both preterm and term small for date babies. Low birth weight babies are more prone to malnutrition, infection and neurodevelopmental handicap during infancy. The neonate loses about 7-8% of body weight during first week of life. The baby regains the birth weight by tenth day and continues to gain weight about 20-30 gm/day for the next 3 months of age.

Infant massage has been shown to alter hormone level in babies and reduce anxiety and stress while promoting relaxation. Physiological effect of massage includes mobilizing fluids, washing out metabolic waste products that build up in muscle and promoting blood flow. The tactile stimulation can activate new fibers carrying touch sensation and the sensory upset from the fibers can decrease pain signals.

In many culture massage with tropical oil is routine. The tropical oil massage provides multiple benefits. Coconut oil massage caused greater weight and height gain in preterm and term infants. Coconut oil is safer to use in hospital situation. The stabilization quality of this oil is particularly advantageous, when used in warm environment. It is rare for coconut oil to cause an allergic reaction because fractionation removes most of the proteins to which the allergens are attached. Coconut oil is readily absorbed. The absorbed oil is bio-available to fill nutritional needs. This may cause resultant improve weight gain (**Bond, 2009**).

Coconut oil massage cause greater weight gain is due to transcutaneous absorption. Coconut oil is a saturated fat, in

medium chain triglycerides. Because of more thin, vascular skin of preterm babies, the oil is readily absorbed. The absorbed oil is bio-available to fill nutritional needs. This may cause result in improved weight gain with coconut oil massage (Soriano, 2001).

### 2. Statement of the Problem

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#### Objectives

- 1) To assess the weight and neurobehavioral responses of low birth weight infants.
- 2) To evaluate the effectiveness of oil massage therapy on weight and neurobehavioral responses of low birth weight infants in experimental group.
- 3) To compare the effectiveness of oil massage therapy on weight and neurobehavioral responses of low birth weight infants between experimental and control group.

### 3. Hypotheses

# The following hypotheses were formulated to test the weight of infant.

 $H_{01}$ : There is no statistically significant difference on weight among low birth weight infants between experimental and control group before oil massage.

 $H_{02}$ : There is no statistically significant difference on weight among low birth weight infants between experimental group Before and after oil massage.

 $H_{03}$ : There is no statistically significant difference on among low birth weight infants weight between control group Before and after oil massage

 $H_{04}$ : There is no statistically significant difference on weight among low birth weight infants between experimental and control group after oil massage.

# The following hypotheses were formulated to test the neurobehavioral response of infant.

 $H_{05}$ : There is no statistically significant difference on neurobehavioral response among low birth weight infants between experimental and control group before oil massage.  $H_{06}$ : There is no statistically significant difference on neurobehavioral response among low birth weight infants between experimental group Before and after oil massage.

 $H_{07}$ : There is no statistically significant difference on neurobehavioral response among low birth weight infants between control group Before and after oil massage

 $H_{08}$ : There is no statistically significant difference on neurobehavioral response among low birth weight infants between experimental and control group after oil massage.

4. Materials and Methods

#### 85.7 90 80 No.of.infants (in %) 70 57. 60 50 42.9 40 Exprimental 30 14.3 control 20 10 0 0 26-30 31-35 36-40 Gestational age (in weeks)





Figure 2: Percentage distribution of infants based on birth weight

 Table 1: Distribution of Infants based on Body Temperature

Temperature	Ex	Experimental group				Control group			
$(in {}^{0}F)$	Pretest Posttest			Pr	etest	Pos	ttest		
	f	f % f %		f	%	f	%		
96.1-98	3	42.9	1	14.3	4	57.1	-	-	

A quasi experimental study was conducted among hospitalized low birth weight infants aged between 10 days to 3 months of life. Quasi experimental, nonequivalent control group design was adopted for the study. Sample sizes of 14 LBW infants were selected by simple random sampling method. Study was conducted in Sri Ramakrishna Hospital, Coimbatore. Methods: Assessment parameters (length, weight, head circumference, chest circumference, Type of feeding includes direct breast feeding, spoon feeding with expressed breast milk and artificial feeding, Amount of feeding and number of feedings per day. Intravenous fluid and parentral nutrition), Modified Brazelton's Neurobehavioral Assessment Scale, (The scale consists of 25 items and scores with some responses from 0-3) was used to assess the baseline data and neurobehavioral response. And oil massage was done to experimental group, 3 times a day in 4 hours interval for 10 days and routine care was provided to infants in control group.

### Plan for data analysis

Data analysis was done by using descriptive and inferential statistics mean, standard deviation, paired and unpaired 't' test.

98.1-100	4	57.1	6	85.7	3	42.9	7	100
TOTAL	7	100	7	100	7	100	7	100

 Table 2: Distribution of Infants based on Heart Rate.

Heart Rate	Ех	Experimental group				Control group			
Beats/min	Pretest		Posttest		Pretest		Posttest		
	f	f %		%	f	%	f	%	
101-120	1	14.3	-	-	-	-	-	-	
121-140	6	85.7	7	100	7	100	7	100	
TOTAL	7	100	7	100	7	100	7	100	

 Table 3: Distribution of Infants based on Respiratory Rate

Respiratory	E	Experimental group				Control group				
Rate	Pretest		Posttest		Pretest		Posttest			
Breaths/min	f	%	f	%	f	%	f	%		
21-30	2	28.6	4	42.9	-	-	-	-		
31-40	5	71.4	3	57.1	7	100	7	100		
TOTAL	7	100	7	100	7	100	7	100		

Table 4: Distribution of Infants based on Length

Length		Experimental group					Control group				
(in Cm)		Pretest Posttest			P	retest	Po	Posttest			
		f	%	f	%	f	%	f	%		
36-40	1		14.3	1	14.3	-	-	-	-		
41-45	6		85.7	5	71.4	4	5 71.4	. 3	42.9		
46-50	-		-	1	14.3	1	2 28.6	4	57.1		
TOTAL	7		100	7	100	,	7 100	7	100		

Table 5: Distribution of Infants based on weight

Weight	E	xperime	oup	Control group				
(in grams)	Pr	etest	Po	sttest	Pretest		Po	sttest
	f	%	f %		f	%	f	%
1100-1299	3	42.9	-	-	2	28.7	1	14.2
1300-1499	3	42.9	4	57.1	1	14.2	-	-
1500-1699	1	14.2	3	42.9	-	-	2	28.6
1700-1800	-	-	-		3	42.9	2	28.6
1900-2099	-	-	-		1	14.2	2	28.6
TOTAL	7	100	7	100	7	100	7	100

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Table 6: Distribution of Infants based on Head

		Circ	unne	erence					
Head	Ex	Experimental group				Control group			
Circumference	Pr	etest	Posttest		Pretest		Posttest		
(in Cm)	f	%	f	%	f	%	f	%	
24-25.9	1	14.2	-	-	-	-	-	-	
26-27.9	3	42.9	1	14.2	3	42.9	2	28.6	
28-29.9	3	42.9	3	42.9	1	14.2	2	28.6	
30-31.9	-	-	3	42.9	3	42.9	3	42.8	
TOTAL	7	100	7	100	7	100	7	100	

 Table 7: Distribution of Infants based on Chest

 Circumference

Chest	Exp	perimen	group	Control group				
Circumference	Pr	retest	Posttest		Pretest		Posttest	
(in Cm)	f	%	f	%	f	%	f	(%)
21-22.9	2	28.6	-	-	-	-	-	-
23-24.9	4	57.1	4	57.1	3	42.8	1	14.3
25-26.9	1	14.3	1	14.3	2	28.6	4	57.1
27-28.9	I	-	2	28.6	2	28.6	1	14.3
29-30.9	I	-	-	-	-	-	1	14.3
TOTAL	7	100	7	100	7	100	7	100

Table 8: Distribution of Infants based on amount of feeding

Amount of	Experimental group				Control group			
feeding	Pre	test	est Posttest		Pretest		Posttest	
(in Ml)	f	%	f	%	f	%	f	%
210-260	7	100	5	71.4	2	28.6	2	28.6
261-310	-	-	2	28.6	3	42.8	1	14.3
311-360	-	-	-	-	1	14.3	3	42.8
361-410	-	-	-	-	1	14.3	1	14.3
TOTAL	7	100	7	100	7	100	7	100

**Table 9:** Comparison of Mean and Standard deviation based on pretest Weight of experimental and control group

1	0	1		0 1
Group	Mean	S.D	Mean	Unpaired 't'
			Difference	
Experimental	1342.86	100.4514	200.007	0.0171
Control	1632.857	230.3414	290.997	NS (P=0.05)
210 21 01				

NS Non Significant;

 
 Table 10: Effectiveness of Oil Massage on Weight before and after oil massage

	1	1	<u> </u>					
Experimental	Mean	S.D	Mean	Paired 't'				
group			Difference					
Pretest	1342.86	100.45	169 57	10.1612				
Post test	1511.43	101.5593	108.57	S** (P=0.01)				

S-: Significant; P:Highly Significant

 Table 11: Comparison of pre and post test Weight among control group

	control group									
Control	Mean	S.D	Mean	Paired 't'						
group			Difference							
Pretest	1632.857	209.4382	12 18206	8.9843						
Posttest	1762.857	251.9212	42.48290	S** (P=0.01)						

S-: Significant; P:Highly Significant

 
 Table 12: Effectiveness of Oil Massage on Weight between experimental and control group

Group	Mean	S.D	Mean Difference	Unpaired 't'
Experimental	1511.429	101.559	252 8576	1.6876
Control	1764.2857	383.179	232.8370	NS P=0.05

NS Non Significant;

 
 Table 13: Comparison of Mean and Standard deviation on pretest Neurobehavioral responses of experimental and

control group				
Group	Mean	S.D	Mean	Unpaired 't'
			Difference	
Experimental	20.86	2.911	2	1.2882
Control	23.86	5.4292	3	NS (P=0.05)

NS Non Significant;

**Table 14:** Effectiveness of Oil Massage on Neurobehavioral responses before and after oil massage

responses before and after on massage				
Experimental	Mean	S.D	Mean	Paired 't'
group			Difference	
Pretest	20.857	2.9114	15 142	6.718
Posttest	36	5.1640	15.145	S** (P=0.01)

S-: Significant; P:Highly Significant

Table 15: Comparison of pre and post test Neurobehaviora
responses among control group

Control	Mean	S.D	Mean	Paired 't'
group			Difference	
Pretest	23.86	5.4292	6 1 4	3.295
Posttest	30	3.2914	0.14	S* (P=0.05)

S-: Significant; P: Significant

**Table 16:** Effectiveness of Oil Massage on Neurobehavioral responses between experimental and control group

Group	Mean	S.D	Mean	Unpaired 't'
			Difference	
Experimental	36	3.5119	6	2.543*
Control	30	3.164	0	S* (P=0.05)

S-: Significant; P: Significant

# 5. Discussion

# Effectiveness of Oil Massage on Weight before and after oil massage

The finding of the study reveals that among 7 infants in experimental group, the pretest mean weight of infants was 1342.86 grams whereas posttest mean weight was 1511.43 grams. The 't' value was 10.162, which is greater than the table value (P=0.01). Hence the hypothesis ( $H_{02}$ ) "there is no significant difference on weight of experimental group before and after oil massage" is rejected.

**Redzepi, et al (2007)** conducted a study to explore the positive effect of oil massage on weight gain. Infants were massage for 15 mins 3 times a day. The study concluded that, the first five days massage can promote weight and positively alter the distribution of sleep wake state in neonate.

# Comparison of pre and post test Weight among control group.

Among 7 infants in control group, pretest mean weight was 1632.857 grams and posttest mean was 1762.857 grams. The 't' value was found to be 8.984, which is greater than the table value (P=0.01). Hence ( $H_{03}$ ) "there is no significant differences on weight of control group before and after oil massage" is rejected.

Effectiveness of Oil Massage on Weight between experimental and control group

The posttest mean weight of control group was 1764.2857 grams and experimental group was 1511.429 grams. The 't' value was found to be 1.68746 which is lesser than the table value (P=0.05). Hence the hypothesis ( $H_{04}$ ) "there is no significant differences between weight of control group and experimental group after oil massage" is accepted.

# Effectiveness of Oil Massage on neurobehavioral response before and after oil massage

In experimental group the Pretest mean neurobehavioral response score was 20.857, posttest was 36. The 't' value was found to be 6.718, which is greater than the table value (P=0.01). Hence the hypothesis ( $H_{06}$ ) "There is no significant differences in neurobehavioral response of the experimental group before and after oil massage" is rejected.

Kelmonson, et al. (2009) studied the effect of oil massage on developmental skills in infant born with LBW, 40 infants randomly assigned to experimental and control group. The study concluded that, LBW infants who received massage intervention had advanced skills in social, self help, gross motor, fine motor and language skill at the age of three through 8 months.

# Comparison of pre and post test neurobehavioral response among control group.

In control group the pretest mean neurobehavioral response score of was 23.86, and posttest score was 30. The 't' value was found to be 3.296. which is greater than the table value (P=0.05). Hence the hypothesis ( $H_{07}$ ) "There is no significant differences in neurobehavioral response of the control group before and after oil massage" is rejected.

# Effectiveness of Oil Massage on neurobehavioral response between experimental and control group

In experimental group the posttest mean neurobehavioral response score was 36 and control group was 30. The 't' value was found to be 2.543. the greater than the table value (P=0.05). Hence the hypothesis ( $H_{08}$ ) "there is no significant differences between neurobehavioral response score of control group and experimental group after oil massage" is rejected.

# 6. Recommendation for Future Study

- 1. A study can be conducted to compare the coconut oil versus mineral oil on weight and neurobehavioral responses among LBW infants.
- 2. A study can be conducted on effect of soyabean oil on somatic growth of preterm infants.
- 3. A comparative study on light pressure versus moderate pressure massage on weight among preterm infants.
- 4. A study can be conducted on effect of oil massage on vagal tone on infants.
- 5. A study can be conducted on effect of oil massage on quality of sleep on infants.

### 7. Conclusion

Massage seems to be a promising solution to improve the growth and development of LBW infants. It is beneficial in many way, it help infants to reduce stress, increase skin integrity, improve development of central nervous system, shorter hospital stay, gain weight and sleep less. Based on these it is clear that, infant massage would be safe, cost effective, easy, beneficial therapy to LBW neonates in Intensive Care Unit.

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