

Massage with Oil Has More Positive Effects on Normal Infants

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Publication info: Pre- and Peri-natal Psychology Journal 11. 2 (Winter 1996): 75-80.

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Abstract: None available.

Full Text: Headnote ABSTRACT: Sixty one-month-old normal infants were randomly assigned to a massage group with oil and a massage group without oil. Massage had a soothing/calming influence on the infants, particularly when given with oil. The infants who received massage with oil were less active, showed fewer stress behaviors and head averting, and their saliva cortisol levels decreased more. In addition, vagal activity increased more following massage with oil versus massage without oil. The use of massage with infants is as old as the Qing dynasty (1644-1911) in China.¹ Infant massage also has strong historical roots in Ayurvedic medicine in India around 1800 B.C.² At least two volumes have been written on infant massage techniques and anecdotal accounts of its therapeutic benefits for various infant problems including colic and sleep problems.^{2,3} However, very little empirical research has been conducted to document the benefits of massage for infants except for research on infants at risk due to a variety of conditions. In preterm infants, for example, massage therapy facilitated weight gain and shortened the hospital stay by 6 days, yielding a cost savings of approximately \$3,000 per infant.⁴⁻⁵ The infants, who were also more socially responsive following massage therapy, were continuing to show a weight advantage along with a mental and motor development advantage at the end of the first year.⁶ Other high-risk groups that have significantly benefitted from massage therapy include 1) preterm infants exposed to cocaine in utero, who gained more weight and showed better motor performance⁷; 2) preterm infants with HIV exposure whose weight and development were positively affected⁸; 3) infants of depressed mothers who also gained more weight and developed better sleeping patterns⁹; and 4) neglected and abused infants who became less touch aversive and more responsive to caregivers.¹⁰ Thus, different groups of high-risk infants have benefitted in several ways. The question of whether normal infants can also benefit from massage therapy was the focus of this study. Although therapists report that massage reduces irritability, enhances sleep and improves parent-infant relationships, no systematic studies have been conducted with normal infants. Another purpose of this study was to determine whether the use of oil enhanced the positive effects of massage. Therapists have anecdotally reported that massaging infants with oil is more effective than massaging without oil. However, this claim was also anecdotal. Our previous studies and those in the literature had provided massage therapy without oil. **METHOD** Subjects Sixty, one-month-old healthy, full-term infants (N = 30 females) were recruited from a university hospital approximately one day after they were delivered. Mothers of full-term, healthy infants were read the informed consent and, following their willingness to consent, were randomly assigned to one of two groups using a random numbers table. The two groups were a massage with oil group and a massage without oil group. The mothers averaged 25.3 years (R = 15-38), and their infants averaged 1.0 month (R = 3-6 weeks). Mothers were low income (M = 4.4 on the Hollingshead two factor index), and their ethnic distribution was 49% African-American, 49% Hispanic and 2% Asian-American. The two groups did not differ on these demographic factors. **Procedures** Massage Therapy. Each infant was massaged for 15 minutes between naptimes in a laboratory that is furnished like a living room. The mother, who was present during the massage procedure, was asked to remove the infant's clothing except the diaper. The infant was placed on a cotton blanket on top of an infant massage mat. The massage therapist (the same therapist for all infants) began by stroking the infant's face along both sides. Johnson and Johnson baby oil was applied (in the case of the oil massage) with long, gentle strokes from hip to foot, stroking the ankle with the hands wrapped around the lower leg, gently squeezing and twisting in a wringing motion. The infant's feet were then massaged using the thumb, covering the entire bottom of each foot, squeezing each toe gently, finishing

with a soothing pull. The massage was continued by making long, milking strokes with the hands wrapped around the infant's leg from upper leg to ankle. These movements were repeated on the infant's other leg, and ended with long, gentle strokes on both legs. The therapist then began the massage on the torso, hand-overhand in a paddle wheel fashion, higher to lower. The experimenter moved fingers in a circular motion clockwise starting at the infant's appendix. The therapist then stroked both sides of the infant's chest with the flats of the fingers, moving from the middle of the chest outward. The stroking continued from the center of the chest moving over the infant's shoulders, then stroking with the flats of the hands over both the chest and shoulders. As the therapist moved to the infant's arms, more oil was applied with long, gentle strokes from the infant's shoulders to hands. The same procedure was used for the infant's legs as that performed on the arms. The therapist then finished the massage with strokes along both sides of the infant's face, moving the flats of the fingers across the infant's forehead, making circular strokes over the temples and hinge of the infant's jaw. The therapist then moved the flats of her fingers over the infant's nose, cheeks, jaw and chin, massaging the area behind the infant's ears, continuing the circular movements into the scalp. Measures. Videotapes taken during the massage were coded for motor activity (limb movements), stress behaviors including grimacing, mouthing and clenched fists, and averting behaviors including head turning and gaze aversion. These behaviors were coded from the videotapes second-by-second on a lap top computer to yield percentage of time the behaviors occurred. Heart rate was recorded to yield a vagal tone measure. Three EKG electrodes were placed on the infant's chest in a standard lead configuration. The electrodes were connected to a Grass Model 12 Neurodata Acquisition system preamplifier with bandpass frequencies set at 1.0 and 100 Hz. and a gain of 2000. The EKG data were acquired using the HEM Data Corporation Snap-Series Software which controls the A-D board and allows the sampling of the amplified bioelectric signal at user specified rates (in this study, 1000/sec). The data were converted to interbeat intervals (IBI) and to vagal tone by Delta-Biometrics, Inc., Mxedit software, which utilizes a method developed by Porges.¹¹ The EKG measure was taken for 3 minutes prior to the massage and during minutes 7 to 10 of the massage. The infant remained lying on the mat while the EKG measure was taken. Finally, cortisol levels were assayed from saliva samples to determine stress levels. Samples were obtained with a suction tube and cortisol levels were determined by radio-immunoassay. Saliva samples were obtained immediately before and twenty minutes after the massage. During the 20 minute waiting period the infants slept in their mothers' arms or an infant seat. Due to the twenty minute lag in cortisol change, saliva samples reflected cortisol levels at twenty minutes prior to the session and at the end of the session.

RESULTS Following t tests that revealed no sex or ethnic differences analyses of variance were conducted with group (oil/no oil) as the between groups measure. As can be seen in Table 1, the infants who received massage with oil: 1) spent less time being active (fewer limb movements); 2) spent less time showing stress behaviors (including grimacing, mouthing and clenched fists); 3) spent less time head averting; 4) had their saliva cortisol levels decrease more during the massage; and 5) showed a larger increase in vagal tone during the massage although the baseline vagal tone levels needed to be corrected for initial level effects because the no oil group had higher baseline values.

Table 1
Means for Massage Oil/No Oil

<i>Variables</i>	<i>Massage</i>		<i>p level</i>
	<i>Oil</i>	<i>No oil</i>	
Motor activity (% time)	45.00	56.00	.05
Averting behaviors			
—grimacing	2.20	3.30	.05
—head turning	1.40	2.60	.05
Stress behaviors			
—mouthing	1.80	5.90	.05
—clenched fists	3.70	9.20	.01
Vagal tone change	+.50	+.20	.05
Cortisol (ng/ml) change	-.98	-.03	.05

DISCUSSION The immediate effects of massage for normal infants appeared to be lower arousal levels. Following the massage session the infants were less active, they showed fewer stress behaviors and spent less time head averting, and their saliva cortisol levels were lower. These data are perhaps not surprising since they are consistent with data suggesting lower stress levels immediately following massage therapy sessions with high-risk infants^{4,5,7,12} and with infants of depressed mothers. Although the underlying mechanism for the massage therapy/stress reduction relationship is unknown, the increase in the infants' vagal tone (particularly for the oil massage group) suggests that parasympathetic activity is enhanced which is a notably more relaxed state characterized by slower heart rate and lower cortisol levels. A longer term study would be needed to determine whether sleep patterns, temperament characteristics, and weight gain were affected, as they have been in the above studies on high-risk infants. The greater effectiveness of massage with oil versus no oil is probably also not surprising given that the lubricity of oil means less friction for the therapist and the infant. With oil the stroking movements can smoother and more rhythmic, which may further enhance the effects inasmuch as infants are readily soothed/pacified by rhythmic stimulation. These factors and others such as the aroma of the oil, of course, confound the oil-no oil comparison and call for additional research with controls for the other qualities of an oil massage. These findings tentatively suggest that massage, especially with oil, can reduce the stress levels of normal infants. The therapy procedure is easy to learn and may contribute to shorter hospitalizations as it has in high-risk infants.⁴ Thus, massage would be a cost-effective procedure for caregivers to learn and then teach to parents so the positive benefits can continue across infancy.

ACKNOWLEDGMENTS This research was supported by an NIMH Research Scientist Award (#MH00331) to Tiffany Field and a grant from Johnson & Johnson Company. We would like to sincerely thank Michele Bernstein, Kirsten Carraway, Bert Rodriguez and Shay Largie for their help with data collection, coding and analyses. We would also like to thank the mother and infants who participated in this research. References

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Publication title: Pre- and Peri-natal Psychology Journal

Volume: 11

Issue: 2

Pages: 75-80

Number of pages: 6

Publication year: 1996

Publication date: Winter 1996

Year: 1996

Publisher: Association for Pre&Perinatal Psychology and Health

Place of publication: New York

Country of publication: United States

Journal subject: Medical Sciences--Obstetrics And Gynecology, Psychology, Birth Control

ISSN: 08833095

Source type: Scholarly Journals

Language of publication: English

Document type: General Information

ProQuest document ID: 198780916

Document URL: <http://search.proquest.com/docview/198780916?accountid=36557>

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Last updated: 2010-06-06

Database: ProQuest Public Health

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