AOTA Evidence Briefs

Developmental Delay in Young Children

**A product of the American Occupational Therapy Association's Evidence-Based Literature Review Project*

DD #7

Massage promotes weight gain, improved behaviors, in premature infants exposed to cocaine

Wheeden, A., Scafidi, F. A., Field, T., Ironson, G., Valdeon, C., & Bandstra, E. (1993). Massage effects on cocaine-exposed preterm neonates. *Developmental and Behavioral Pediatrics*, *14*, 318–322.

Level: IB1a

Randomized controlled trial, fewer than 20 participants per condition, high internal validity, high external validity

Why research this topic?

Research has shown that massage facilitates growth and development in healthy, premature infants, promoting weight gain, more mature awake and active behavior, and more mature motor activity. However, no research has been reported on massage's effects on premature infants who have been exposed to cocaine and other drugs in the womb, despite widespread evidence of more perinatal complications and neurological and behavioral abnormalities in such infants. Wheeden and her associates (1993), all affiliated with the University of Miami (FL), decided to research this issue.

What did the researchers do?

The researchers selected 30 premature infants (gender not reported) from an intermediate care unit. All had been exposed to cocaine in the womb. The criteria for inclusion were (1) a **gestational age** (see *Glossary*) of less than 37 weeks; (2) a birthweight of less than 1,500 grams (3.28 lbs.); (3) no genetic anomalies, chromosomal aberrations, congenital heart malformations, gastrointestinal disturbances, central nervous system dysfunctions, or overt manifestations of congenital infection or maternal seropositivity for syphilis, hepatitis B, or HIV; (4) a stay in the neonatal intensive care unit of less than 50 days; (5) an entry weight into the study of between 1,000 and 1,650 grams (2.19 and 3.61 lbs., respectively); and (6) a positive screen for cocaine, or the mother reporting use of it. The infants averaged 30 weeks in gestational age. The researchers randomly assigned them to a massage group or a **control group** (see *Glossary*) following a special procedure to match the groups in gestational age, birthweight, time in intensive care, and weight on entry into the study.

Infants in both groups received standard nursery care. Infants in the massage group also received massage therapy for three 15-minute sessions during 3 consecutive hours each day for 10 days. Each session involved three standardized 5-minute phases. The first and third phases involved **tactile** (see *Glossary*) stimulation; the second involved **kinesthetic** (see *Glossary*) stimulation. In the tactile phases, the newborn lay on his or her stomach and was stroked in each region of the body in a specific order. In the kinesthetic phase, the newborn lay on his or her back and had his or her arms and legs gently bent and straightened.

The outcome areas of interest were *weight gain* (as calculated from daily weighings); *postnatal complications* (as measured by the Postnatal Complications Scale and the Newfoundland Scale); and *behavior* (as measured by the Brazelton Neonatal Behavior Assessment Scale). The measures of complications and behavior were taken on the first and last days of the study.

What did the researchers find?

The massage group averaged a significantly greater weight gain—28%—than the control group. Two groups differed at the beginning on average heart rate; the massage group was significantly higher.

On the postnatal complications measures, both groups demonstrated **significantly** (see *Glossary*) fewer complications at the end of the study. By the 10th day, however, the massage group had significantly fewer complications than the control group.

On the behavior measures, the massage group had significantly better motor scores at the end of the treatment period, whereas the control group's scores remained the same. The massage group also showed significantly improved **orientation** (see *Glossary*) and significantly fewer stress behaviors at the end of the treatment period. The control group again remained the same.

What do the findings mean?

- The findings suggest that massage therapy can improve the clinical course of premature infants exposed to cocaine. The improvements in weight gain and motor behavior, and the reductions in stress behaviors, may contribute to the infants' later development.
- The findings should boost confidence in funding intervention programs that use massage therapy to promote weight gain in premature infants who have been exposed to cocaine.
- The findings also suggest productive directions for research—for example, exploration of the use of massage with premature infants who have been exposed to other drugs in the womb or who are at risk for other reasons.

What are the study's limitations?

- Subject recruitment unclear.
- Amount of treatment touch pressure unclear; not replicable.
- Year(s) of cohort not specified; important to compare cocaine-exposed medical protocols.
- One hospital.
- Latency effects of treatment not measured (central nervous system [CNS] compromise).
- Reliability of experimenter not established.
- Reliability of assessors not stated.
- Infants receiving massage treatment had higher heart rate at baseline.

Glossary

control group—a group that received special attention similar to that which the treatment group received, but did not receive the treatment.

gestational age—age from conception, rather than from birth.

kinesthetic—relating to the sense perception of movement of muscles and tendons.

orientation—response to animate and inanimate stimuli, and overall alertness.

significance (or significant)—a statistical term; this refers to the probability that the results obtained in the study are not due to chance, but to some other factor (such as the treatment of interest). A significant result is one that is likely to be generalizable to populations outside the study.

Significance should not be confused with clinical effect. A study can be statistically significant without having a very large clinical effect on the sample. For example, a study that examines the effect of a treatment on a client's ability to walk may report that the participants in the treatment group were able to walk significantly longer distances than the control. However, if you read the study you may find that the treatment group was able to walk, on average, 6 feet, whereas the control group was able to walk, on average, 5 feet. Although the outcome may be statistically significant, a clinician may not feel that a 1-foot increase will make his or her client functional.

tactile—relating to touch or to the sense of touch.

■ Terminology used in this document is based on two systems of classification current at the time the evidence-based literature reviews were completed: *Uniform Terminology for Occupational Therapy Practice—Third Edition* (AOTA, 1994) and *International Classification of Functioning, Disability and Health (ICIDH-2)* (World Health Organization [WHO], 1999). More recently, the *Uniform Terminology* document was replaced by *Occupational Therapy Practice Framework: Domain and Process* (AOTA, 2002), and modifications to *ICIDH-2* were finalized in the *International Classification of Functioning, Disability and Health* (WHO, 2001).

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