

Brief Report

Brief Report: Improvements in the Behavior of Children With Autism Following Massage Therapy

Angelica Escalona,¹ Tiffany Field,^{1,2} Ruth Singer-Strunck,¹ Christy Cullen,¹ and Kristen Hartshorn¹

Twenty children with autism, ages 3 to 6 years, were randomly assigned to massage therapy and reading attention control groups. Parents in the massage therapy group were trained by a massage therapist to massage their children for 15 minutes prior to bedtime every night for 1 month and the parents of the attention control group read Dr. Seuss stories to their children on the same time schedule. Conners Teacher and Parent scales, classroom and playground observations, and sleep diaries were used to assess the effects of therapy on various behaviors, including hyperactivity, stereotypical and off-task behavior, and sleep problems. Results suggested that the children in the massage group exhibited less stereotypic behavior and showed more on-task and social relatedness behavior during play observations at school, and they experienced fewer sleep problems at home.

KEY WORDS: massage therapy for autism.

INTRODUCTION

Several traditional and nontraditional treatments for children with autism have been researched, but no single treatment modality has been effective with autism (Tsai, 1992). Medications have improved some symptoms (Mesibov, Adams & Klinger, 1997), imitation by parents has been effective (Dawson & Galpert, 1990), as has behavior modification in highly structured environments (Rogers, 1999; Tsai, 1992). Massage therapy has been effective for children with autism in at least one study. In that study, Field and colleagues (1997) reported positive effects following 1 month of massage therapy conducted (twice weekly for 20 minutes) by massage therapists. These effects included less

touch aversion and fewer autistic behaviors such as failing to orient to sounds and stereotypic behaviors, and more on-task behavior and social relatedness during classroom behavior observations.

The present study was designed to have parents administer the massage therapy so that the children could receive the treatment on a daily basis at no cost. Receiving nightly massages before bedtime was expected to help reduce sleep problems frequently noted in these children (Klinger & Dawson, 1996), just as it had in previous studies on preschool children with sleep problems (Field *et al.*, 1996) and depressed children who had fewer night-wakings following a week of daily massages (Field *et al.*, 1992). The present study followed the same massage therapy and assessment procedures as the Field *et al.*, (1997) study, except that the children's parents were trained by massage therapists to administer the massages on a nightly basis before the children's bedtime, rather than therapists massaging the children twice weekly during class time. More frequent massages by a familiar person (the parent) were expected to yield greater improvement in the child's sleep and preschool behaviors.

¹Touch Research Institute, University of Miami School of Medicine.

²Correspondence and requests for reprints should be sent to Tiffany Field, Ph.D., Touch Research Institutes, University of Miami School of Medicine, PO Box 016820 (D-820), Miami, FL 33101; e-mail: tffield@med.miami.edu

METHODS

Participants

Twenty children with autism, ages 3 to 6 years ($M = 5.2$ years, $SD = 1.8$), were recruited from a school for children with autism. The children ($n = 12$ boys) were middle socioeconomic status ($M = 1.8$ on the Hollingshead Index [1975]), and they were distributed 72% white, 20% Hispanic, and 8% African American. The children had been diagnosed by two independent clinicians approximately 1 to 3 years earlier using DSM III-R criteria. These DSM III-R diagnoses were used instead of re-diagnosing using the DSM-IV because the clinician who had conducted the DSM III-R diagnosis had significantly more testing experience. The children were given the Vineland Adaptive Behavior Scale and the Sequenced Inventory of Communication Development. The groups did not differ on these scores ($M = 66$ and 62 , respectively, for the control and massage groups on the Vineland; $M = 21$ and 19 , for receptive and $M = 18$ and 15 for the expressive language scores). The discrepancy between the adaptive behavior and language scores is not surprising given that children with autism often have lower language scores than adaptive behavior scores. Because these scores came from different sources, we administered Preschool Performance Scale (PEP-R) (Schopler & Reichler, 1979) on all participants. The two groups did not differ on PEP-R developmental scores. The children were randomly assigned from the same developmental level classrooms to the massage therapy and reading attention control groups. The parents in both groups were told that "reading stories and massaging might increase relaxation and sleep in children."

Procedures

Massage Therapy Group

The children in this group received parent (mostly mothers) provided massage therapy for 15 minutes just prior to bedtime every night for 1 month. Parents were trained by a massage therapist in the same massage procedure used in our previous study (Field *et al.*, 1997). This involved firmly massaging with moderate pressure five regions of the child's body in the following sequence: arms and hands, legs, front, and back.

Attention Control Group

The parents of the children in the attention control group were asked to read a Dr. Seuss story to their

children for 15 minutes just prior to bedtime every night for 1 month. After the completion of the study, the parents in the control group also received instruction in massage therapy.

Assessments

The children in both groups were assessed on the first and last days of the study using the same measures used by Field *et al.*, (1997) in order to have comparative data as follows: the revised Conners Teacher and Parent Scales (Conners, 1997), classroom and playground behavior observations, and sleep diaries.

Revised Conners Scales

The revised Conners Scales (Conners, 1997) were completed by the children's teacher (who was blinded to the group assignment of the children) and parents (the primary caregivers) on the first and last days of the study. These scales consist of 80 items on the parent scale (clustered on 14 subscales) and 59 on the teacher scale (clustered on 13 subscales). To minimize the number of variables, only five of the subscales were used including: the ADHD Index, restless-impulsive behaviors, emotional index, the global index, and the DSM-IV scale for inattentiveness. Respondents rate each item on a 4-point Likert scale (0 = not at all; 1 = a little; 2 = pretty much; 3 = very much) and summary scores were computed for each scale by adding across items.

Classroom and Playground Behavior Observations

Behavior observations were conducted in the classroom and on the playground on the first and last days of the 1-month long study. Research associates, who were blinded to the children's group assignment, recorded these behaviors on time sample unit sheets every 10 seconds for a total of 15 minutes per child. The behaviors were taken from the Field *et al.* (1997) study and included: positive response to touch, on-task behavior, stereotypical behavior, and social relatedness to the teacher. Interobserver reliability was based on 25% of the observations and was calculated by Kappa (M Kappa = .71).

Sleep Diaries

Parents also recorded their children's sleep behavior in sleep diaries on the first night and on the night before the last day. These diaries included the amount of fussing, restlessness, crying, self-stimulating be-

havior, and the number of times the children left the bed. These behaviors were rated on 5-point Likert Scales (1 = not at all, 2 = a little, 3 = fair amount, 4 = a lot, 5 = extreme). This scale was designed for the current study.

MANOVAs with repeated measures (first/last day) were conducted on the Conners Scales, on the play behaviors, and on the sleep diary scores. The MANOVA on the Teacher Conners Scales yielded a significant days effect, $F(5, 14) = 3.89, p < .05$, and a significant group by days interaction effect, $F(5, 14) = 3.08, p < .05$. Follow-up ANOVAs and Bonferroni *t*-tests for interaction effects revealed group equivalence on the baseline scores and significantly greater improvement for the massage therapy group from the first to the last day on the teachers' ratings for the Emotional Index (62 to 55 compared with 62 to 60; $t = 1.83, p < .05$), and the DSM-IV criteria for Inattentiveness (56 to 50 compared with 60 to 62; $t = 1.75, p < .05$). Follow-up ANOVAs on the parents' ratings also indicated equivalent baseline scores and significantly greater improvement for the massage therapy group on the ADHD index (66 to 60 compared with 65 to 64; $t = 1.91, p < .05$), restless-impulsive behavior (66 to 60 compared with 66 to 63; $t = 2.05, p < .05$), the emotional index (58 to 54 compared with 55 to 55; $t = 2.11, p < .05$), and the DSM-IV criteria for inattentiveness (62 to 56 compared with 63 to 61; $t = 1.97, p < .05$).

A MANOVA on the observation behaviors with repeated measures over location (classroom, playground) and days (first/last day) yielded a significant days effect, $F(6, 13) = 3.70, p < .05$, and a significant group by days interaction effect, $F(6, 13) = 2.98, p < .05$. Follow-up ANOVAs on classroom observations indicated group equivalence on the baseline behaviors, and a greater decrease in stereotypical behaviors (8% to <1% compared with 5% to 2%; $t = 2.01, p < .05$) and a greater increase in on-task behavior (81% to 94% compared with 81% to 91%; $t = 2.13, p < .05$) from the first to the last day for the massage group. Follow-up ANOVAs on playground observations indicated group equivalence on baseline behavior, and a greater decrease from the first to the last day of the study in the frequency of stereotypical behaviors (13% to 2% compared with 12% to 8%; $t = 3.29, p < .01$) and a greater increase in social relatedness (14% to 20% compared with 14% to 11%; $t = 2.04, p < .05$) toward the teacher in the massage therapy group.

The groups were equivalent on baseline sleep behavior, but because the groups were not normally distributed, nonparametric paired *t*-tests were performed

on the change scores for sleep behaviors. These tests indicated greater declines for the massage therapy group on the following behaviors: fussing/restlessness, crying, self-stimulating behavior, and getting out of bed.

DISCUSSION

The clinical significance of this study is that two problems that impair the classroom performance of children with autism—namely, off-task behavior and sleep problems—were improved. The children in the massage therapy group became more attentive at school, as reflected by the Teacher Conners Rating Scale and an increase in on-task behavior during the classroom behavior observations. This increased attentiveness is similar to the increased on-task behavior noted in the earlier massage therapy study by Field and colleagues (1997). Although the underlying mechanism for this enhanced attentiveness is not known, massage therapy has also been noted to enhance parasympathetic (vagal) activity (Field, 1998), which is highly correlated with attentiveness (Porges, 1997). Stereotypical behaviors also decreased in the classroom and on the playground, again consistent with the decrease in stereotypical behaviors in our earlier massage therapy study (Field *et al.*, 1997).

The behavior changes could have related to the children being more rested from having slept better, as reflected in their lower levels of fussing, crying, self-stimulating and getting out of bed. However, the sleep ratings may have been biased because the parents were not blinded to their child's group assignment. In addition, the parents expressed "really liking" the massage, suggesting the possibility of a Hawthorne effect. Nonetheless, these findings were not surprising, because massage therapy improved behavior and enhanced sleep (more time in deep sleep and fewer nightwakings) in another study on depressed children in which the data were based on blindly rated videotapes rather than parent ratings (Field *et al.*, 1992). Improved sleep may derive from the increase in parasympathetic (vagal) activity typically noted following massage therapy. A future study would ideally monitor sleep with the more objective actometers (Eaton, Mckeen, & Lam, 1988). Other measures, such as vagal activity and stress hormone assays, might also better inform us regarding potential underlying mechanisms. In the interim, massage therapy provided by parents appears to be an effective way of diminishing a few major problems for children with autism, including sleep problems, stereotypies and off-task behavior.

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