BRIDGE Brief
A Research to Practice Resource
IHD
2012 ISSUE 2

An Empirical Investigation of Sensory Integration Interventions for Children with ASD

By Andrew W. Gardner

PURPOSE

In a review of large group studies (Williams & Erdie-Lalena, 2009), the authors concluded that although sensory integration (SI) interventions are widely used, there is insufficient empirical support for their use with children with Autism Spectrum Disorders (ASD). The purpose of the current investigation was to determine whether the single-subject design research evidence is strong enough to warrant the use of SI interventions.

SUMMARY

Based on the standards for single-subject research, an intervention could be recognized as empirically supported if the literature included at least 5 high quality studies conducted by at least 3 researchers in at least 3 geographical locations with favorable outcomes and with at least 20 participants (Horner et al, 2005). The findings of the current review of single-subject SI research are consistent with those found in the previous review of large group studies—that is SI interventions lack empirical support.

IMPLICATIONS

Many children with ASD experience under-sensitivity or over-sensitivity to specific stimuli in their environments. However, the empirical evidence does not endorse recommendations of SI therapies to address these problems. The continued use of SI therapies is potentially problematic because they can replace more effective procedures. Service providers and families should consider the available evidence when selecting interventions to address sensory-related behaviors of children with ASD and seek practices with stronger empirical support (see Devlin, Healy, Leader & Hughes, 2011).

Introduction

Sensory integration (SI) interventions are often recommended for children with autism spectrum disorders (ASD). SI is a "neurological process that reflects an individual's ability to organize internal and environmental sensations to regulate and function efficiently in the environment" (Roberts, King-Thomas, & Boccia, 2007, p. 555). SI interventions consist of a variety of methods that provide auditory, kinesthetic, tactile, vestibular, or visual stimulation to the child. Many SI practitioners use nonspecific therapies including: trampolines, therapy balls, and net swings, in addition to specific therapies targeting one area, such as oral motor SI using a T shaped 'chewy tube.' Many therapists use intervention packages (e.g. sensory diet) addressing multiple areas of sensory integration.

Featured Review

In the current study, a total of 23 single-subject design data-based articles were identified and rated according to the quality indicators proposed by Horner and colleagues (2005). Review articles, large group studies with inferential statistics, and non-data based articles were excluded, since these studies had already been reviewed (see Williams & Erdie-Lalena, 2009).

Five types of SI interventions were identified in the literature: 1) General SI therapy articles included combinations of techniques for providing auditory, kinesthetic, tactile, vestibular, or visual stimulations. Services used nonspecific therapies and equipment including trampolines, therapy balls, net swings, etc.; 2) Auditory Integration SI therapy articles included specific applications targeting a child's auditory senses; 3) Deep Pressure SI therapy articles included methods such as "Hug Machines," weighted vests, holding therapy, and hyperbaric chambers that apply pressure to the body; 4) Visual Integration SI therapy articles included methods applied to the visual system to change the child's perception of spatial relationships and eye contact; 5) Oral Motor SI therapy articles included specific applications targeting a child's oral senses of the mouth, lips, or tongue.

Articles were scored based on 21 quality indicators (Horner et al., 2005). Only 2 of the 23 articles met the criteria for "acceptable" quality. The 2 acceptable articles were in the area of deep pressure therapy, but results were mixed. One study reported decreases in anxiety for 6 children after the use of a hug machine. The other study demonstrated no improvement in behavior (3 children) using weighted vests.

Implications for Practice

SI therapies for children with ASD are widely recommended in schools and clinics. However, the empirical research documenting their efficacy is significantly limited. Evidence-based practitioners are required to consider the empirical base for interventions they recommend and/or use. Although research evidence needs to be considered alongside client values, professional judgment, and context, caution is warranted before using or recommending SI therapies.

Best Available Evidence

In addition to the current review, three other sets of researchers consistently found limited support for the use of SI therapies. Stephenson and Carter (2009) conducted a systematic review of weighted vests for children with ASD and concluded that there was insufficient evidence to support recommendations for their use. Williams and Erdie-Lalena (2009) reported the evidence of large group studies on SI interventions and found strong empirical support was lacking. Finally, a recent systematic review of SI therapies (both single-subject and large group studies) reported that the current body of literature was not substantial enough to advocate the use of such therapies with children with ASD (Lang et al., 2012).

Importantly, a few reviewers have reported "mixed results" suggesting some SI therapies may have a positive effect on specific behaviors. Positive results should be interpreted with caution because the quality of studies is not always high. It will be important for future research to examine the efficacy of SI therapies using scientifically rigorous methods that more clearly show direct effects (or lack thereof) of the therapy on children's behavior (see Devlin et al, 2011).

Professional Judgment, Client, and Context

Families of children with ASD are often unaware of the services available to them and most are unaware of the evidence that supports or doesn't support interventions. Consistent with the evidence-based practice philosophy, practitioners have an obligation to attend to the research literature of the interventions they recommend and families have the right to be informed about the potential of interventions. When the research evidence for considered interventions is presented, it can be integrated appropriately with client and contextual variables to make evidence-based decisions.

About the Author

Andrew W. Gardner, PhD, BCBA-D is bilingual and bicultural and has been serving Hispanic and Latino families of children with ASD and related disabilities over the past 15 years across clinic, home, school, and public settings. Dr. Gardner is an Associate Professor in the Department of Psychology, the clinical supervisor of NAU's Behavioral Pediatric Clinic, and Research Director of NAU's University Center for Excellence in Developmental Disabilities (UCEDD). Dr. Gardner also serves as clinical faculty under the Arizona LEND through the College of Medicine, Department of Pediatrics at the University of Arizona.

References

Devlin, S., Healy, O., Leader, G. & Hughes, B. M. (2011). Comparison of behavioral intervention and sensory-integration therapy in the treatment of challenging behavior. Journal of Autism and Developmental Disorders, 41, 1303-1320.

Horner, R. H., Carr, E. G., Halle, J., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify practice in special education. Exceptional Children, 71,165–179.

Lang, R., O'Reilly, M., Healy, O., Rispoli, M., Lydon, H., Streusand, W., Davis, T., Kang, S., Sigafoos, J., Lancioni, G., Didden, R. & Giesbers, S. (2012). Sensory integration therapy for autism spectrum disorders: a systematic review. Research in Developmental Disabilities, 6, 1004-1018.

Stephenson, J. & Carter, M. (2009). The use of weighted vests with children with autism spectrum disorders and other disabilities. Journal of Autism and Developmental Disorders, 39, 105 – 114.

Williams, L. D. & Erdie-Lalena, C. R. (2009). Complementary, Holistic, and Integrative Medicine: Sensory Integration. Pediatrics in Review, 30 (12), 91-93.

INSTITUTE for Human Development

Bridge Briefs are a publication of the Institute for Human Development (IHD). The IHD is a research and training program located at Northern Arizona University and part of a national network of University Centers for Excellence in Developmental Disabilities (UCEDD).

P.O. Box 5630
Flagstaff, AZ 86011-5630
ihd@nau.edu
Phone: 928-523-4791
TTY: 928-523-1695
Fax: 928-523-9127

NORTHERN ARIZONA UNIVERSITY