Research in Autism Spectrum Disorders 7 (2013) 1168–1181

Contents lists available at SciVerse ScienceDirect

Research in Autism Spectrum Disorders

Journal homepage: http://ees.elsevier.com/RASD/default.asp

Comparison of community-based verbal behavior and pivotal response treatment programs for young children with autism spectrum disorder

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ARTICLE INFO

Article history:
Received 21 March 2013
Received in revised form 6 June 2013
Accepted 7 June 2013

Keywords:
Autism spectrum disorder
Early intensive behavioral intervention
Verbal behavior
Pivotal response treatment

ABSTRACT

This research compared the outcomes of a community-based group program based on the verbal behavior approach to early intervention (Sautter & LeBlanc, 2006; Sundberg & Michael, 2001) to the outcomes of a program based on Pivotal Response Treatment (Bryson et al., 2007; Koegel & Koegel, 2006). Fourteen preschool children with autism spectrum disorder in each program were matched by baseline chronological age and cognitive score. Assessments were conducted at the initiation of treatment and 12 months later to measure cognitive, receptive and expressive language, and adaptive behavior skills, as well as problem behavior and parenting stress. Results for both groups showed statistically significant changes in cognitive scores, receptive and expressive language age equivalents, and problem behavior scores. Significant results were not found for either adaptive behavior or parenting stress scores. Changes in cognitive and adaptive behavior scores were similar to those reported in published studies of applied behavior analytic programs of similar intensity. Study limitations and recommendations for future research are provided. Although additional research is needed to examine the long-term effectiveness of the programs examined in this study, it appears that both hold promise as effective early intervention approaches that are also relatively cost-effective.

1. Introduction

Over the past few years, research on the outcomes of early intensive behavioral intervention (EIBI) programs for young children with autism spectrum disorder (ASD) has been examined in five meta-analyses (Eldevik et al., 2009; Makrygianni & Reed, 2010; Reichow & Wolery, 2009; Spreckley & Boyd, 2009; Virués-Ortega, 2010). In a recent review, Reichow (2012) identified 26 studies that were included in at least one of these meta-analyses; 18 of the 26 were included in two or more. Nineteen of the 26 studies were *efficacy* studies that examined the impact of intervention in "ideal" conditions that typically included selection of participants who were deemed to be "good candidates" with no comorbidities; therapists who were well trained and well supervised; and manualized treatment that was carefully planned and implemented with fidelity (Eikeseth, Klintwall, Jahr, & Karlsson, 2012; Perry et al., 2008). The remaining seven studies examined EIBI *effectiveness* in "real life" community-based settings (e.g., preschools) that served a broader range of clients. Typically, staff in these settings were trained to provide the intervention but were not supervised as rigorously as those in efficacy study settings, and

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http://dx.doi.org/10.1016/j.rasd.2013.06.002

treatment fidelity was assessed less rigorously or not at all (Eikeseth et al., 2012). While the five meta-analyses differed with regard to the criteria used for study inclusion, the outcome variables that were examined, and the formulae used to calculate effect size, all but one (Spreckley & Boyd, 2009) endorsed both the efficacy and effectiveness of EIBI as an evidence-based practice. However, the EIBI effectiveness studies (e.g., Bibby, Eikeseth, Martin, Mudford, & Reeves, 2002; Scheinkopf & Siegel, 1998) typically showed less impressive outcomes than the efficacy studies. Some of the factors contributing to this differential outcome included funding constraints that resulted in reduced intensity or duration of treatment; the challenges involved in hiring, training, supervising, and retaining community-based staff; and the wide heterogeneity of the children who were enrolled.

In his review of these meta-analyses, Reichow (2012) noted that EIBI programs with higher treatment intensity (i.e., more hours per week), longer treatment duration (i.e., more continuous weeks), the inclusion of parent training, and the involvement of supervisory personnel trained in the intervention method developed at the University of California at Los Angeles (UCLA; Davis, Smith, & Donahoe, 2002; Lovaas, 1981, 2003) appeared to be related to better child outcomes in at least one domain. The UCLA method employs both discrete trial and incidental teaching techniques to target skills across developmental domains, including imitation, matching, basic and advanced receptive and expressive language, play, and self-care skills. Treatment is typically provided for 30–40 h per week over 1–3 years in children's homes and communities, with active parent involvement in the treatment process. However, despite the robust body of research on the positive outcomes that can be achieved through the UCLA method, it is not a good fit for all children with ASD and their families. Johnson and Hastings (2002) examined the barriers that may act as deterrents to families who consider enrolling their child in a UCLA-based program. More than half of the 141 families who participated in the study identified funding barriers as well as problems with recruiting, training, and maintaining trained interventionists and supervisors in a supportive and committed team. Other barriers included the need for extensive time and energy to organize the intervention program, to the detriment of other family needs (e.g., those of siblings); potential disruption of family life and invasion of the home by non-family members (i.e., interventionists who are present in the home for up to 40 h per week); and lack of the physical space required for home-based intervention. These barriers are likely exacerbated by family factors such as low socio-economic status, English as a Second Language (ESL), the presence of more than one child with ASD in a family, and a lack of social support within and outside of the family.

Because of these concerns, a few EIBI studies have examined the effectiveness of low-intensity programs that are based on the principles of applied behavior analysis (ABA) but that require fewer staff resources and are thus less demanding and less expensive to deliver. For example, Eldevik, Eikeseth, Jahr, and Smith (2006) compared the outcomes of behavioral ($n = 13$) and eclectic treatment programs ($n = 15$) in which participants received 1:1 intervention for 12 h/week, on average. The children in this study were all under 6 years of age and attended regular kindergarten or elementary school classes for 8–12 h/week, in addition to receiving 1:1 instruction. Children in the behavioral treatment group were instructed by teachers who were trained and supervised by psychologists with extensive experience in the UCLA method (Lovaas, 1981, 2003). Children in the eclectic group were instructed by teachers who implemented a number of interventions, including augmentative communication (via sign language and/or graphic symbols), ABA procedures, sensory-motor therapies, and other methods, depending on the teachers' experience. After 2 years of treatment, the behavioral groups made more gains than the eclectic group, although the gains were more modest than those achieved in more intensive UCLA treatment studies.

Some research has also examined the outcomes of low-intensity early intervention programs based on Pivotal Response Treatment® (PRT; Koegel & Koegel, 2006), a naturalistic behavioral intervention method that is derived from ABA principles. PRT targets "pivotal" areas of child development such as motivation, responsivity to multiple cues, self-management, and social initiations, and has been shown in numerous small-scale studies to result in collateral improvements in social and communication skills as well as reductions in problem behavior (see http://education.ucsb.edu/autism/documents/SummaryChartofEmpiricalSupportforPRT.pdf). Unlike the UCLA method, PRT interventions do not follow a set curriculum. Rather, each child's intervention team develops individual goals with an emphasis on functional communication and other developmentally appropriate skills that are taught in the context of play and other naturally occurring routines. Specifically, interventionists are taught to provide instructional supports incorporating: (a) clear, uninterrupted instructions that are delivered in response to a child's focus of attention; (b) child preferences and choices to increase motivation; (c) frequent task variation; (d) interspersal of previously acquired tasks with new acquisition tasks; (e) reinforcement of response attempts in addition to correct responses; and (f) the use of natural reinforcers that are directly related to the child's response (e.g., if a child says "ball," she receives the ball, not praise or an unrelated item such as food) (Koegel, Koegel, & Brookman, 2003). PRT was deemed an established (i.e., evidence-based) intervention, according to the National Standards Report (National Autism Center, 2009).

Two large-scale community-based studies to date have examined the effectiveness of PRT as a low-intensity EIBI treatment for young children with ASD. Baker-Ericzén, Stahmer, and Burns (2007) provided a 12-week parent education program to 158 parents of young children with ASD and measured child change using the Vineland Adaptive Behavior Scales (Sparrow, Balla, & Cicchetti, 1984), a parent report measure. Results indicated significant improvements on the Vineland subscales for communication, socialization, and daily living skills for children ages 3–5 but not for those 6 years of age or older. However, this study did not assess the fidelity of parent implementation of PRT, which has been shown to be related to child outcomes (Coolican, Smith, & Bryson, 2010). More recently, I. Smith et al. (2010) reported the effectiveness of PRT in a study conducted in Nova Scotia (NS), Canada. The NS EIBI model included both parent training and therapist-implemented