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Are We There Yet? The State of Early Prediction and Intervention in Autism Spectrum Disorder

Connie Kasari, PhD

Center for Autism Research and Treatment, the University of California Los Angeles (UCLA)
Semel Institute for Neuroscience and Human Behavior

Two articles in this issue highlight the existing challenges in identifying and targeting the developmental trajectory of autism spectrum disorder (ASD). In the first article, Daniels *et al.*¹ review current screening methods used to identify children with ASD, recognizing that these methods have increased positive screen results in the community but rarely include follow-up to diagnosis and referral for early intervention. The second article illustrates how targeting specific early deficits in autism (joint attention and joint engagement) by nonspecialists in the community results in significant improvements in these core deficits but not later language and cognitive scores compared with the control group.² These articles are welcome contributions toward resolving current questions about how best to maximize the effect of early identification and intervention for young children with ASD.

The effort to identify children with ASD as soon as possible represents a major goal in the field, and methods for screening, diagnosis, and referral have received great attention in the past 2 decades. Daniels *et al.* reviewed methods for screening children with ASD, noting that different methods are used that go beyond the traditional well-baby checks and that these nontraditional methods increase the number of positive screen results. It is reassuring that broad screening efforts in non-health care settings, such as schools or daycare centers, do in fact increase the number of children who screen positive. However, despite increased efforts at screening and increased rates of positive screen results, rates of referral and uptake of services are rarely documented. An important issue the article raises is the extent to which we are appropriately engaging families in the screening process to ensure better uptake of recommendations for diagnosis and treatment. This need for engaging families is likely even more important in under-served and low-resourced communities.

However, an additional issue for the field is that even if families are actively engaged in the process and understand the need for early intervention, access to effective interventions may not be readily available, particularly for families from underserved and low-resourced settings. To date, specific interventions designed for autism require high levels of professional training and, when implemented through parents for children younger than 2 years, have not shown efficacy compared with general community-based practices.^{3,4} The

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Correspondence to Connie Kasari, PhD, UCLA, Psychiatry, 760 Westwood Boulevard, Los Angeles, CA 90024;
kasari@gseis.ucla.edu.

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field needs to shift its focus in ASD intervention development to understanding the active ingredients of an effective intervention and developing models that can be translated to community providers so we are more inclusive in providing early interventions to all.

The second study provides an illustration of a potential road map to increasing the effective delivery of interventions in the community. In 2- to 4-year-old children with confirmed ASD, Kaale *et al.*² present a rare example of longitudinal follow-up data from a randomized controlled trial carried out in a community preschool setting. Although all children were receiving community preschool services, children in the treatment group whose teachers were trained to implement a joint attention intervention for shorter than 1 hour per day for 8 weeks showed significant gains in initiating joint attention and longer periods of child-initiated joint engagement. Spontaneous initiations of joint attention and joint engagement are arguably some of the most difficult skills to improve in children with ASD.⁵ The effects the investigators obtained at the end of this brief intervention were maintained at follow-up and were significantly different from the control group. Although the 2 groups improved in language and cognitive outcomes over the follow-up period, there was no significant difference between groups. Thus, the intervention changed some of the core deficits noted in the development of young children with ASD but did not extend to general developmental areas of language and cognition.

This latter article highlights the promise and the limitations of brief interventions aimed at core deficits and the need for deeper investments in treatment development. The promise is that a short-term intervention can have long-lasting effects on children's development, presumably because of the interaction between environment (teacher training in this case) and child skill improvement. Moreover, this trial was based on a train-the-trainer model in which the intervention was delivered by community clinicians within participants' everyday environments.⁴ Train-the-trainer trials can increase community capacity and sustainability and decrease training costs by developing high-level trainers who each can educate numerous interventionists. These types of models are important in tackling the early identification to referral to intervention pipeline.⁶

The limitations, however, are related to the short-term nature of the interventions and what represent the best endpoints to measure treatment effects.⁷ The investigators were careful to note that changing joint attention and joint engagement in these children did not lead to significant differences in language and cognitive raw scores 1 year later, but all children made progress. Endpoints to assay early intervention efficacy need rethinking. Early interventions are indicated for all children showing developmental delays, and indeed several studies have found that children improve in developmental outcomes over time regardless of group assignment.^{4,8} Changes in autism-specific core deficits, however, may change only if directly targeted as illustrated in this article. The latter study begins to tease apart potential active ingredients, delivered by nonspecialist providers in community settings, with significant benefit over time. These types of targeted interventions may be what are needed for the very youngest children referred to community early interventions.

Taken together, these reports represent important signposts on the road to real progress in ASD identification and intervention but also remind us a long journey remains ahead.

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