

Early Intervention in Autism Spectrum Disorder

Authors

Dr. Shweta Srinivasan¹, Dr.Nelia Mathew², Dr. Maria Lewin³

The Unit of Hope, Department of Paediatrics, St. John's Medical College and Hospital, Bengaluru

Corresponding author:

Dr. Shweta Srinivasan

Address: The Unit of Hope, St. John's Medical College and Hospital, Johnnagar, Sarjapura Road, Bengaluru-560034.

Phone number: 9757154449 E-mail ID: shweta.srinivasan.v@gmail.com

Abstract:

Background:

The prevalence of Autism Spectrum Disorders is steadily on the rise with its global prevalence at 1 in 36 children as of May 2024. There has been a rapid change in our understanding of ASD as being a psychological condition characterized by hallucinations and fantasy to being a profound abnormality of language development with ritualistic behaviour to its present identity as a neurodevelopmental variant with sensory-perceptual difficulties. Evolution in the theories of autism mandates an evolution in interventions aimed at its management.

This article aims to highlight the core beliefs, benefits, and drawbacks of the different models of intervention and to explore a comparatively new model of early intervention in children with Autism called Communication Developmental Eclectic Approach to Language Learning (Com-DEALL).

Method: Recent literature in the last 25 years on the various intervention models of ASD were analysed and a detailed literature review with regards to the inception, principle, team and program attributes of the Com-DEALL program were surveyed.

Result: While other models of intervention



such as ABA, Floor-time (Developmental Interventions) and Early Start Denver Model (ESDM, a form of NDBI) have proven positive outcomes the shortage of trained experts and their cost are some inhibiting factors for their effective administration in a resource-limited setting such as ours. Com-DEALL program is an Indigenous program which is an efficacious and relatively inexpensive alternative.

Conclusion: The overarching theme of neurodiversity and acceptance should be kept in mind. The basis of any treatment plan should come from a thorough evaluation of the child's strengths and weaknesses. Com-DEALL program offers such an individualized and culturally acceptable alternative to the more traditional intervention models.

Keywords: Autism, intervention, children, Com-DEALL, communication

Introduction:

The prevalence of Autism Spectrum Disorders is steadily on the rise with its global prevalence at 1 in 36 children as of May 2024[1]. Although this increase in diagnosis among 0 to 5-year-olds has often been attributed to the liberal coding of the International Classification of Diseases, 10th Revision in 2015, studies state that the increased screening for autism is the likely reason [1].

The theories of Autism have been evolving since the early 1900s. With the evolution in understanding the etiopathogenesis of autism, there has been an evolution in the intervention strategies employed in its management. The initial perception of autism as a psychological condition has rapidly changed, especially near the turn of the century, to its current perception of it being a neurodevelopmental variant [2]. Autism Spectrum Disorder went from being understood as a disorder of hallucinations and fantasy in infancy to being a profound abnormality of language development associated with ritualistic and compulsive phenomena [2]. This view has further undergone a transformation wherein the sensory-perceptual difficulties which have long been believed to be associated with ASD have now been recognized as the core deficit in autism, which accounts for children with autism processing the world differently from their peer group.

On the whole, there are three broad intervention models in the management of ASD, namely, Behavioural therapy (Applied Behavioural Analysis), Developmental Education, and Naturalistic Developmental Behavioural Intervention (NDBI). With the evolution of our understanding of ASD, behavioral therapies which were once held as the gold standard for the management of children with autism for over

two decades, are now being gradually phased out to give way to developmental education and NDBI models of intervention. This article aims to highlight the core beliefs, benefits, and drawbacks of each of the above models and to explore a comparatively new model of early intervention in children with Autism called the Communication Developmental Eclectic Approach to Language Learning (Com-DEALL).

Applied Behaviour Analysis:

ABA is based on the principles of learning and behaviour postulated by B. F. Skinner and Darwin's theory of natural selection, which believes that all behaviours occur as a consequence of outcomes. That is, any behaviour that results in a favourable outcome will perpetuate the behaviour further through reinforcements whereas those behaviours which do not have any favourable outcomes will diminish and eventually be extinguished [3]. Skinner established that new skills or behavioural responses may be either developed or changed via operant conditioning procedures such as shaping, prompting, and modeling [3].

Ivar Lovaas developed the first intensive ABA treatment model called Early and Intensive Behavioural Intervention based on Discrete-trial Teaching (DTT) which focuses on teaching by giving discrete/distinct instructions repeatedly. Correct responses to these instructions would be reinforced using praise and/or rewards while incorrect responses would be met with correction or absence of praise. In young children with ASD, it is recommended that the DTT model be applied to teach basic skills for at least 25 hours per week or more. As the child progresses, a shorter duration of therapy (15 hours per week) is recommended to target more complex behaviours, for example, social pragmatic skills. Maximal

benefits have been noted with individualized and teacher-implemented approaches to ABA rather than parent-implemented approaches.

With the development of naturalistic models of ASD management, the focus has shifted from DTT as the primary mode of managing behaviours in ASD to more developmentally based naturalistic methods of teaching like the Natural Language Paradigm (NLP), Pivotal Response Training (PRT) and Early Start Denver Model (ESDM) with specific recommendations as to how the two may be blended [3]. While children on naturalistic intervention methods were found to have early requesting behaviour and compliance, DTT was found to be superior to it in teaching targeted skills [3].

Naturalistic Development Behavioural Intervention :

NDBIs are a set of intervention models that combine behavioral principles with insights from developmental psychology. The term NDBI has been used only since 2015 [4] but treatments that use NDBI principles have been around far longer [5,6]. Naturalistic behavioral interventions provided a different perspective and approach to handling unwanted and challenging behaviors, which led to a diminishment of their frequency [5,6]. NDBI serves as an umbrella term that includes several similar treatment models, such as the Early Start Denver Model (ESDM), Pivotal Response Treatment (PRT), Enhanced Milieu Teaching (EMT), Incidental Teaching (IT), Improving Parents as Communication Partners (Project ImPACT), Social ABCs, Joint Attention, Symbolic Play, Engagement and Regulation (JASPER) [4,7].

The core components of all NDBIs include

1. Interactions which should take place face-to-face and at the child's level.

2. The therapist/caregiver's approach should follow the child's lead and actively participate in the activity chosen by the child.
3. Using a positive affect and animation the therapist/caregiver should meet the child's sensory needs.
4. The therapist/caregiver should model appropriate language and behavior to match the child's developmental level.
5. All communication attempts by the child should be responded to by repeating, clarifying, or expanding on what is expressed.
6. The therapist/caregiver should use natural rewards to encourage communication.
7. Direct teaching is used for new and emerging skills and should be frequent.
8. The therapist/caregiver should provide high-quality direct teaching such as using clear instructions and teaching when the child is motivated [4,7,8].

Implementation of NDBIs should occur in natural environments, throughout the child's daily routines, at home, or at school. This is to tackle the lack of motivation and generalization noticed with more typical, highly structured ABA. Family involvement is also an integral part of NDBIs. Parents should be involved in goal setting as well as the intervention implementation and most NDBIs specifically incorporate parent training such that parents can act as intervention providers [4,7,8].

Metanalysis of outcomes using NDBI shows significant positive effects in the areas of social engagement and cognition [9]. NDBIs may increase language, social communication, play skills, and cognition in young children with autism. In general, NDBI methods are well-suited to improve outcomes for young children [10].

Communication Developmental Eclectic Approach to Language Learning (Com-DEALL):

Communication DEALL program is an indigenous early intervention program started in Bangalore in 2000 intending to meet the need of the exponentially increasing prevalence of ASD and to re-patriate these children into mainstream schools once the intensive intervention has been established.

Principle

The Com-DEALL program is based on the principle that the core underlying cause of autism is biological (and not psychological) [11]. Whatever this biological cause may be (genetic or environmental or a combination of both), it is found to cause sensory perceptual difficulties in hearing, vision, touch, smell, and kinaesthetic senses. It is these sensory perceptual differences that account for autistic children perceiving the world around them differently from their neurotypical counterparts [11]. Some of the core deficits of ASD such as language delay, poor social communication skills, and some stereotypies can be explained by these differences in perception. For example, a child on the spectrum may have an unusual talent in music due to a prolonged auditory perception time but this perceptual difference may impair his ability to process speech in real-time, thereby accounting for poor speech perception [12].

Autistic children also exhibit difficulties in motor executive functions such as planning, working memory, impulse control, inhibition, initiation, and monitoring of action. This may impair gross and fine motor functions such as carrying out actions when requested to do so. It may also impair the fine oro-motor movements crucial for speech production [13]. Thus, the communication-

social-emotional deficits which are often believed to be the core deficits in ASD are, in effect consequences of these differences in sensory-motor processing. When these difficulties manifest early during development they may affect the entire process of language acquisition, thus impairing communication.

Behavioural challenges seen in such children are considered mere reactions to the various sensory-motor perceptual differences and communication difficulties that they face. The program thus targets the sensory-perceptual, motor, and communication difficulties which consequentially help overcome the behavioural challenges.

Team

The ComDEALL Program includes a team of occupational therapists, physical therapists, speech-language pathologists, developmental psychologists, and educators.

Program

Before enrolling a child, a detailed developmental profile of the child is generated using the CDDC (ComDEALL Developmental Checklist), and the parents are counselled regarding their child's profile and the target interventions required. The Program enrolls a small group of children diagnosed with ASD ranging from 18 months to 6 years for a period of eleven months. The initial 6-8 weeks of intervention target Prerequisite Basic Learning Skills such as eye contact, joint attention, sustained attention, sitting tolerance, and compliance. This is followed by individualized interventions based on the child's profile targeting the sensory-motor perceptual difficulties. Language intervention is based on the developmental approach. It focuses on intensive stimulation in a communicative environment

based on the motto “Communicate WITH the child, not ABOUT the child”. Behavioural challenges are tackled during the therapy as they occur with uniform reinforcements being used by all therapists [11].

Evidence states that the Communication DEALL program results in significant gains in the skills in all eight developmental domains of the CDDC with a parallel improvement in the overall behaviour [14]. Early intervention was also found to be associated with higher rates of children with ASD being enrolled and retained in mainstream schools [15].

While other models of intervention such as Applied Behaviour Analysis, Floor-time (Developmental Interventions), and Early Start Denver Model (NDBI) have proven positive outcomes there is a shortage of experts trained to administer them and are expensive for a resource-limited setting such as ours. It is also imperative that the intervention model is individualized and culturally appropriate to the population that it is targeted at, for maximal benefits. Communication DEALL program is a home-grown indigenous program that has proven to be an efficacious and relatively inexpensive alternative [14].

The approach to ASD has evolved and improved over time. It is important for clinicians and therapists to understand the need to adapt their therapy regime and tailor it individually for each child. The goals of therapy have often been based on neurotypical standards decided by non-autistic people. This has often caused “autistic masking”, the phenomenon whereby autistic people often feel the need to mask their autistic features to fit in [16]. Another concern is also the short-term outcomes. While this is essential, it is also equally important to look out for their long-term mental health [17].

Conclusion:

The overarching theme of neurodiversity and acceptance should be kept in mind. The basis of any treatment plan should come from a thorough evaluation of the child’s strengths and weaknesses.

Financial Support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References:

1. Sesay MM, McCracken CE, Stewart C, Simon G, Penfold R, Ahmedani B, et al. Short report: Transition to International Classification of Diseases, 10th Revision and the prevalence of autism in a cohort of healthcare systems. *Autism* 2024;28. <https://doi.org/10.1177/13623613231220687>.
2. Evans B. How autism became autism: The radical transformation of a central concept of child development in Britain. *Hist Human Sci* 2013;26. <https://doi.org/10.1177/0952695113484320>.
3. Roane HS, Fisher WW, Carr JE. Applied Behavior Analysis as Treatment for Autism Spectrum Disorder. *Journal of Pediatrics* 2016;175. <https://doi.org/10.1016/j.jpeds.2016.04.023>.
4. Wang M, Schuck R, M.P. Baiden K. Naturalistic Developmental Behavioral Interventions as Value-Based and Culturally Adapted EBPs for Autistic Individuals. *Autism Spectrum Disorders - Recent Advances and New Perspectives*, 2023. <https://doi.org/10.5772/intechopen.108124>.

5. McGee GG, Feldman RS, Morrier MJ. Benchmarks of social treatment for children with autism. *J Autism Dev Disord* 1997;27. <https://doi.org/10.1023/A:1025849220209>.
6. McGee GG, Morrier MJ, Daly T. An incidental teaching approach to early intervention for toddlers with autism. *Journal of the Association for Persons with Severe Handicaps* 1999;24. <https://doi.org/10.2511/rpsd.24.3.133>.
7. Schreibman L, Dawson G, Stahmer AC, Landa R, Rogers SJ, McGee GG, et al. Naturalistic Developmental Behavioral Interventions: Empirically Validated Treatments for Autism Spectrum Disorder. *J Autism Dev Disord* 2015;45. <https://doi.org/10.1007/s10803-015-2407-8>.
8. Frost KM, Brian J, Gengoux GW, Hardan A, Rieth SR, Stahmer A, et al. Identifying and measuring the common elements of naturalistic developmental behavioral interventions for autism spectrum disorder: Development of the NDBI-Fi. *Autism* 2020;24. <https://doi.org/10.1177/1362361320944011>.
9. Tiede G, Walton KM. Meta-analysis of naturalistic developmental behavioral interventions for young children with autism spectrum disorder. *Autism* 2019;23. <https://doi.org/10.1177/1362361319836371>.
10. Crank JE, Sandbank M, Dunham K, Crowley S, Bottema-Beutel K, Feldman J, et al. Understanding the Effects of Naturalistic Developmental Behavioral Interventions: A Project AIM Meta-analysis. *Autism Research* 2021;14. <https://doi.org/10.1002/aur.2471>.
11. PrathibhaKaranth. Communication DEALL Comprehensive Early Assessment & Intervention Program. *Communicacids*; 2022.
12. Karanth P. From aphasia and allied disorders to autism spectrum disorders-A mutualistic symbiotic relationship. (A five decade long journey in neuro-communication disorders). *Ann Indian AcadNeurol* 2020;23:S63–6. https://doi.org/10.4103/aian.AIAN_653_20.
13. Belmonte MK, Saxena-Chandhok T, Cherian R, Muneer R, George L, Karanth P. Oral motor deficits in speech-impaired children with Autism. *Front IntegrNeurosci* 2013. <https://doi.org/10.3389/fnint.2013.00047>.
14. Karanth P, Shaista S, Srikanth N. Efficacy of communication DEALL--an indigenous early intervention program for children with autism spectrum disorders. *Indian J Pediatr.* 2010 Sep;77(9):957-62. doi: 10.1007/s12098-010-0144-8. Epub 2010 Sep 7. PMID: 20821283.
15. Karanth P, Chandhok TS. Impact of early intervention on children with autism spectrum disorders as measured by inclusion and retention in mainstream schools. *Indian J Pediatr* 2013;80. <https://doi.org/10.1007/s12098-013-1014-y>.
16. Alaghband-rad J, Hajikarim-Hamedani A, Motamed M. Camouflage and masking behavior in adult autism. *Front Psychiatry* 2023;14. <https://doi.org/10.3389/fpsy.2023.1108110>.
17. Jónsdóttir SL, Brynjarsdóttir B, Saemundsen E, Sigurdsson JF. Long-term outcome of children with autism who received different forms of early intervention during their preschool years: a pilot study of 15 young adults. *Scand J Child AdolescPsychiatrPsychol* 2018;6. <https://doi.org/10.21307/sjcapp-2018-006>.