

# Autism Spectrum Disorders: Recent Diagnostics and Management Trends

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## ABSTRACT

Autism spectrum disorder (ASD) is a set of neurodevelopmental multi-factorial disorders characterized by a deficit in social behaviors and nonverbal interactions such as reduced eye contact, facial expression, and body gestures in the first 3 years of life. The aim of the study was to explore about the recent diagnostics and management trends of ASD. Literature was searched considering both electronic databases such as PubMed and manually. It can be said that the main treatment goals are to target core behaviors to improve social interactions & communication, reduction of irritable & disruptive behavior, strategies to integrate into schools & develop meaningful peer relationships and long-term skills in independent living.

**Keywords:** Autism, impairment, communication, behavior, reinforcement

## INTRODUCTION

Autism spectrum disorder (ASD) is a complex neurodevelopment multi-factorial disorder comprising of impairment in social skills and repetitive/restricted behavior. The pattern of onset of the disorder is typically seen around 2 years of age but may be seen earlier at the age of 12 months. The worldwide prevalence of patients with autistic spectrum disorders is increasing but the pathophysiology of this disorder is still not completely clear. <sup>[1][2]</sup> Various symptoms which characterize this disorder includes impairment in non-verbal behavior,

peer relationship, spoken language, initiating conversation, Lack of social/emotional reciprocity, poor imitative play and restrictive, repetitive, stereotyped behavior. These symptoms are grouped into two domains namely- persistent deficits in social communications and social interaction and restrictive repetitive patterns of behavior. <sup>[2]</sup>

According to the National Mental Health Survey of India (2015-16), prevalence of ASD is 1.6% (age group 13-17years). It is four times more common in boys than in girls. <sup>[3]</sup>

## Historical Background

Autism word has been derived from a Greek word "Autos" meaning self and "Ismos" meaning a state of mind. In other words we can say that it is state of morbid self absorption. Autism word was first coined by Eugen Bleuler in 1910 as one of the four symptoms of Schizophrenia. Four A's which were used by him were- ambivalence, loss of affect, loosening of association, and autism. Leo Kanner in one of his paper publication described about eleven children who were having "innate inability to form affective contact with people". He described "autistic sameness" and "insistence on sameness" in the same paper entitled "Autistic Disturbance of Affect Contact". And therefore its name was changed to "Early Infantile Syndrome" or "Kanner Syndrome". <sup>[4]</sup> Since then various terminologies came into use including

borderline psychosis, childhood schizophrenia, infantile psychosis, and symbiotic psychosis.<sup>[5]</sup> In 1944 Hans Asperger conducted study on children and adolescents with communication & social skills deficits, restrictive and repetitive pattern of behaviors. These children and adolescents had minimal language deficit which was different from children with autism and hence he later termed these children with Asperger's Syndrome. Hans Asperger later on described two other similar disorders of childhood named as Rett's disorder & childhood disintegrative disorder (Heller's Syndrome). In these disorders, there was loss of learnt skills after attainment of two to three years of age along with autistic symptoms.<sup>[2]</sup> Subsequent research in children with these symptoms landed up to its inclusion in DSM –III in 1980 as “Infantile Autism” (DSM –III, 1980).<sup>[6]</sup>

Earlier, Persistent Developmental Disorder was used as an umbrella term which included autistic disorder, Childhood disintegrative disorder, Asperger's syndrome, Rett's syndrome and PDD NOS (Not Otherwise Specified).

#### **DSM-IV TO DSM-5**

In DSM-IV autism was included in the chapter of “Disorders usually first diagnosed in infancy, childhood and adolescence”, in DSM-5, it was moved into the chapter of “Neurodevelopmental disorders”. Earlier in DSM-IV, the symptoms of autism were grouped as a triad of qualitative impairment in social interaction, impairment in communication and restrictive, repetitive, stereotyped behavior. In DSM-5, triad was reduced to diad-persistent deficits in social communications and social interaction and restrictive repetitive patterns of behavior. DSM-5 also added hyper or hypo-reactivity to sensory input (e.g. indifference to pain). Rett's syndrome has been removed as a separate diagnosis and added as a specifier in DSM-5. In other words, all the categories

of PDD in DSM-IV have been merged into ASD.<sup>[2,7]</sup>

A meta-analysis of six studies conducted to compare diagnosis of ASD by DSM-5 and DSM-IV TR showed overall total reduction of diagnosis by 37% (Autism -20%, Asperger's syndrome-45%, PDD NOS-74%). Due to this, reduction is seen in new patients of autism getting the insurance and social scheme benefit like special school services.

As there is better description of criteria with more specific examples in DSM-5, it leads to easy identification of children with ASD by general pediatricians. As most recent studies have used Autism Diagnostic Observation Schedule (ADOS) as diagnostic instrument, there is minimal impact on research work. But studies which included diagnosis of Asperger's syndrome are facing problems as there is absence of a clear continuity of this diagnosis.

#### **ICD-10 TO ICD-11**

Autism spectrum disorder in the ICD-11 incorporates childhood autism and Asperger's syndrome from ICD-10 under a single category, characterized by social communication deficits and restricted, repetitive, and inflexible patterns of behavior or activities. Qualifiers are provided for the level of impairment in intellectual functioning and functional language abilities to understand various presentations of autism spectrum disorder.<sup>[8,9]</sup>

#### **TREATMENT GOALS**

The main treatment goals are to target core behaviors to improve social interactions & communication, reduction of irritable & disruptive behavior, strategies to integrate into schools & develop meaningful peer relationships and long-term skills in independent living.

**Treatment strategies include** - Intensive behavioral programs, parent training and participation, academic interventions and pharmacological management.

## **APPLIED BEHAVIORAL ANALYSIS (ABA)**

It is a type of behavioral therapy with techniques based upon various types of conditioning or learning (Classical, Instrumental and Social) to change behavior of a child. It is started at an earliest possible age by a certified therapist. It targets social skills, communication, language, self-help skills, education, intelligence, restrictive and repetitive behavior.<sup>[10]</sup> The individualized goals and objectives are tailored to a child. Peer play forms an important part of this intervention. Reinforcements or rewards are given for accomplishments and mastery of skills. It is delivered as one on one basis, general intensity of around 10 hours/week for about 40 weeks. There is a break time at the end of every hour 10-15min break to practice the learnt skills.<sup>[11,12]</sup>

There are common techniques used in ABA:

- **Task analysis** - Task is analyzed into its component parts and taught through the use of chaining
- **Chaining** - The skill is broken down into small units for easy learning and then each step is taught and mastered & chained together into whole skill
- **Prompting** - Cue is used to encourage a desired response with most-to-least sequence and faded systematically which minimizes errors during learning
- **Fading** - As mastery of a skill at a particular prompt level is gained, the prompt is faded to eventually not needing prompts. It ensures that individual does not become overly dependent on a particular prompt
- **Shaping** - includes gradually modifying the existing behavior into the desired one and after some interactions, successful shaping would be done to replace the hitting behavior with patting or gentler behavior.

Various skills are taught to a child including proper sitting (sit down, sit up straight, Hands quiet), gross motor imitation (Raising hands, touching nose, clapping), imitation of facial expressions (Opening

mouth, Smiling, Frowning), and basic self help skills (eating, day time toilet training, building independent toileting skills, undressing, dressing).<sup>[12]</sup>

**The common ABA programs are** - Discrete Trial Training (UCLA Lovaas method), Early Start Denver Model (ESDM)<sup>[13]</sup>, Pivotal Response Training (PRT)<sup>[14]</sup> and Picture Exchange Communication System (PECS).<sup>[15]</sup>

O. Ivar Lovaas pioneered Applied Behavior Analysis (ABA) interventions at University of California, Los Angeles (UCLA). It is a highly structured comprehensive Program and relies on Discrete Trial Training (DTT) methods (also called Discrete Trial Instruction or DTI). DTT is a practitioner-led, structured instructional procedure which breaks tasks down into simple subunits to shape new skills. It is also called Trail & Error Learning-Trail, Prompting, Fading and Reinforcements are commonly used techniques to fasten learning.<sup>[16]</sup>

Early Start Denver Model includes interventions in natural settings (day care/ home/ play). Parents are considered as co-therapists and therapy is continued at home.<sup>[13]</sup> It focuses on very young children (18-36 months of age). It includes interdisciplinary team of early educational teachers, childcare staff, speech pathologist, psychologist and an occupational therapist.<sup>[17]</sup> It targets expressive and receptive language, gestural and vocal imitation, turn-taking, joint attention, cognitive goals (e.g., matching, counting), social (e.g., giving and sharing materials), play skills. On entry into ESDM children's current skill levels evaluated using the ESDM Curriculum Checklist. The learning objectives are defined for child, designed to be achieved within a 12 week period. At the end of 12 week period new learning objectives for the next 12 week period are defined based on a new assessment with the Curriculum Checklist.<sup>[18]</sup>

**Picture Exchange Communication System (PECS)** was developed in 1985 by

Lori Frost and Andy Bondy. It is a form of augmentative and alternative communication. It acts as communication aid for children with autism spectrum disorder (ASD).<sup>[15]</sup> The target is preschoolers to adults with communicative, cognitive, and physical impairments (cerebral palsy, and deafness). It specifically targets skills of spontaneous communication. Verbal prompts are not used to avoid prompt dependency. Child will exchange a picture of a desired item with a teacher/communicative partner. After learning to request for a desired item child learns to discriminate among symbols and then how to construct a simple sentence. Different size, shape, color, number, etc. are also taught so the child can make their message more specific.<sup>[19]</sup>

**Pivotal Response Training (PRT)** given by Robert and Lynn Koegel taught parents to facilitate social and communication development within home by targeting pivotal social behaviors for mastery by child. It is expected that once main social skills were mastered, a natural generalizing of social behaviors will follow. It targets areas of a child's development- motivation, responsiveness to multiple cues, self-management and social initiations. The advantage of this training is simultaneous improvement in social, communicative, and behavioral areas that were not specifically targeted earlier.<sup>[14]</sup>

**Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH)** was developed by Eric Schopler (1971) at University of North Carolina at Chapel Hill.<sup>[20]</sup> It is a university-based system of community regional centers. The core services include demonstration programs as per clinical and training needs of individuals, families, and professionals. The goals are to increase individual skills and making environment more suitable to the individual needs. It includes consultation, diagnostic evaluation, consultation sessions of families, parent support groups, social play and recreation

groups. Use of visual supports/visual schedules, and strategies are taken from ABA.<sup>[21]</sup> Schedules are must as children with autism have difficulty in sequential memory and organization of time. The directions are given verbally, written, and with PECS. It majorly involves 25 hours per week.<sup>[22]</sup>

Reichow et al in 2012 studied 5 meta-analyses and suggests EIBI is a comprehensive treatment model for ASDs with good empirical support. There were significant increases in IQ and lesser but significant increases in adaptive behavior & language. There were higher gains with high intensity of treatment, parental training & younger age at intake of therapy.<sup>[23]</sup>

### **Pharmacotherapy in Autism Spectrum Disorder**

Pharmacotherapy focuses on the core symptoms of restricted & repetitive behavior and co-morbidities (hyperactivity, irritability, and mood symptoms). It is used as an adjunct to psychological interventions. SSRIs such as fluoxetine are widely prescribed medications in repetitive behavior in ASD (Hollander et al., 2015). A Cochrane review in 2013 including 9 RCTs, 320 subjects showed that SSRIs (fluoxetine, fluoxamine, and citalopram) used for restricted and repetitive behavior did not have much effect.<sup>[24]</sup> Other drugs include second generation antipsychotics such as risperidone and aripiprazole. Aripiprazole has been FDA approved for the treatment of irritability in autism.<sup>[25]</sup>

The recent trials with lesser evidence include memantine<sup>[26]</sup>, tri-cyclic antidepressants<sup>[27]</sup>, Galantamine<sup>[28]</sup>, N-acetylcysteine plus risperidone<sup>[29]</sup>, Hyperbaric oxygen therapy<sup>[30]</sup>, pentoxifylline plus risperidone<sup>[31]</sup>, and auditory integration training.<sup>[32]</sup>

### **CONCLUSION**

The major goals of treatment of children with ASD are to maximize the child's functional independence and increase quality of life by minimizing the core

autism spectrum disorder features, facilitating development and learning, promoting socialization, reducing maladaptive behaviors, and supporting families towards interacting with their children in ways that promote social interaction skills, managing problem behaviors, and teach daily living skills and communication. Children with ASD would continue to learn and manage their problems throughout life, but most will continue requiring some level of support.

## REFERENCES

1. Eissa N, Al-Houqani M, Sadeq A, Ojha SK, Sasse A, Sadek B. Current enlightenment about etiology and pharmacological treatment of autism spectrum disorder. *FrontNeurosci.* 2018; 12:1-26.
2. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th Ed. Washington, DC: American Psychiatric Association; 2013:27-31
3. Gururaj G, Varghese M, Benegal V, Rao GN, Pathak K, Singh LK et al. National Mental Health Survey of India, 2015-16: Summary. *NIMHANS Publ.* 2016; 1-62.
4. Tsai, L. Y. The Impact of DSM-5 on Autism Spectrum Disorder. *Psychopathology Review.*2015; a2 (1):3-16.
5. Volkmar FR, McPartland JC. From kanner to DSM-5: Autism as an evolving diagnostic concept. *Annu Rev Clin Psychol.* 2014; 10:193-212.
6. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 3rd Ed. Washington, DC: American Psychiatric Association; 1980.
7. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th Ed. Washington, DC: American Psychiatric Association; 1994.
8. World Health Organization. The ICD- 10 classification of mental and behavioural disorders: clinical descriptions and diagnostic guidelines. Geneva: World Health Organization; 1992:147-54.
9. Reed GM, First MB, Kogan CS, Hyman SE, Gureje O, Gaebel W, et al. Innovations and changes in the ICD-11 classification of mental, behavioural and neuro developmental disorders. *World Psychiatry.* 2019; 18(1):3-19.
10. Hernandez P, Ikkanda Z. Applied behavior analysis: Behavior management of children with autism spectrum disorders in dental environments. *J Am Dent Assoc.* 2011; 142(3):281-7.
11. Virués-Ortega, J. (2010). Applied behavior analytic intervention for autism in early childhood: Meta-analysis, meta-regression and dose-response meta-analysis of multiple outcomes. *Clinical Psychology Review,* 30(4), 387-399.
12. Lovaas OI. Teaching Developmentally Disabled Children. United States of America: Library of Congress Cataloging in Publication Data; 1980.11-23.
13. Dawson G, Rogers S, Munson J, Smith M, Winter J, Greenson J, et al. Randomized, controlled trial of an intervention for toddlers with autism: The early start Denver model. *Pediatrics.* 2010; 125(1):17-24.
14. Koegel, R. L., & Koegel, L. K. Pivotal response treatments for autism: Communication, social, & academic development. Baltimore: Paul H Brookes Publishing; 2006:69-111.
15. Bondy A., & Frost L. The Picture Exchange Communication System. *Focus on Autistic Behavior.*1994; 9, 1-19.
16. Lovaas OI. Behavioral treatment and normal educational and intellectual functioning in young autistic children. *J Consult Clin Psychol.* 1987; 55(1):3-9.
17. Rogers SJ, Estes A, Lord C, Vismara L, Winter J, Fitzpatrick A, et al. Effects of a brief early start Denver model (ESDM)-based parent intervention on toddlers at risk for autism spectrum disorders: A randomized controlled trial. *J Am Acad Child Adolesc Psychiatry.* 2012; 51 (10): 1052-65.
18. Smith M, Rogers S, Dawson G. The Early Start Denver Model: a comprehensive early intervention approach for toddlers with autism. In: Handleman JS, Harris SL, editors. *Pre-school Education Programs for Children with Autism.*2008; 3:65-101.
19. Overcash, A., Horton, C. & Bondy, A. The Picture Exchange Communication System: Helping individuals gain functional communication. *Autism Advocate.*2010; 3:21-4.
20. Schopler E, Brehm SS, Kinsbour M, Reichler RJ. Effect of Treatment Structure

- on Development in Autistic Children. Arch Gen Psychiatry. 1971; 24:415-21.
21. Ichikawa K, Takahashi Y, Ando M, Anme T, Ishizaki T, Yamaguchi H, et al. TEACCH-based group social skills training for children with high-functioning autism: A pilot randomized controlled trial. Biopsychosoc Med. 2013; 7(1):1-8.
  22. Corsello CM. Early intervention in autism. Infants Young Child. 2005; 18(2):74-85.
  23. Reichow B, Barton EE, Boyd BA, Hume K. Early intensive behavioral intervention (EIBI) for young children with autism spectrum disorders (ASD). Cochrane Database Syst Rev. 2012;(10):1-54
  24. Williams K, Brignell A, Randall M, Silove N, Hazell P. Selective serotonin reuptake inhibitors (SSRIs) for autism spectrum disorders (ASD). Cochrane Database Syst Rev. 2013; 2013(8):1-49.
  25. Xiong W. Pediatric Pharmacologic Management of Autism-Associated Behavioral Dysregulation. 2017; 3-5.
  26. Aman MG, Findling RL, Hardan AY, Hendren RL, Melmed RD, Kehinde-Nelson O, et al. Safety and efficacy of memantine in children with autism: Randomized, placebo-controlled study and open-label extension. J Child Adolesc Psychopharmacol. 2017; 27(5):403-12.
  27. Hurwitz R, Blackmore R, Hazell P, Williams K, Woolfenden S. Tricyclic antidepressants for autism spectrum disorders (ASD) in children and adolescents. Cochrane Database Syst Rev. 2012; (3):1-31.
  28. Ghaleiha A, Ghyasvand M, Mohammadi MR, Farokhnia M, Yadegari N, Tabrizi M, et al. Galantamine efficacy and tolerability as an augmentative therapy in autistic children: A randomized, double-blind, placebo-controlled trial. J Psychopharmacol. 2014; 28(7):677-85.
  29. Nikoo M, Radnia H, Farokhnia M, Mohammadi MR, Akhondzadeh S. N-acetylcysteine as an adjunctive therapy to risperidone for treatment of irritability in autism: A randomized, double-blind, placebo-controlled clinical trial of efficacy and safety. Clin Neuropharmacol. 2015; 38(1):11-7.
  30. Xiong T MD. Cochrane Database of Systematic Reviews Hyperbaric oxygen therapy for people with autism spectrum disorder (ASD) (Review) Hyperbaric oxygen therapy for people with autism spectrum disorder (ASD). Hyperbaric oxygen therapy for people with autism spectrum d. 2016; (10).
  31. Akhondzadeh S, Fallah J, Mohammadi MR, Imani R, Mohammadi M, Salehi B, et al. Double-blind placebo-controlled trial of pentoxifylline added to risperidone: Effects on aberrant behavior in children with autism. Prog Neuro-Psychopharmacology Biol Psychiatry. 2010; 34(1):32-6.
  32. Sinha Y, Silove N, Wheeler D, Williams K. Auditory integration training and other sound therapies for autism spectrum disorders: A systematic review. Arch Dis Child. 2006; 91(12):1018-22.

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