JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

OVERVIEW: AUTISM SPECTRUM DISORDERS

[1] Aishwarya. J, [2] M.Hepzibah susan , [3] Sindu Divakaran

[1]Student, [2]Student, [3]Assistant Professor

Department of Biomedical Engineering, School of Bio and Chemical Engineering,

Sathyabama Institute of Science and Technology,

Chennai, India.

Abstract: Autism spectrum disorders can cause some individuals to act out of the ordinary. Autism is a neurodevelopmental disease that lasts a lifetime and is distinguished by behavioral, social, and communication abnormalities. People with autism disorders may experience difficulties interacting with their surroundings as a result of these characteristics. These traits are formed very early in development or at birth. Although the exact neurobiological signaling pathways have not yet been identified, it is clear that autism spectrum disorders reflect how specific parts of the developing brain function. Autism spectrum disorders are characterized by areas of equal intensity with distinct deficit patterns. A child's ability to acquire social skills, self-care skills, and community participation is often impaired throughout life. Autism spectrum disorders are often accompanied by speech and intellectual disabilities. Therefore, when establishing educational programs, it is important to consider the demands typically associated with autistic disorders and the needs associated with potential disabilities. Currently, the main treatment for autism spectrum disorders is education, directly for children and indirectly for parents and teachers. This overview article aims to explain how autism develops, how it is treated, and how different means of communication can be used.

Index Terms – Autism Spectrum Disorders (ASDs), Neurobiological Pathways, Communication Tools, Social Interaction, Education

I.INTRODUCTION:

Autism indeed affects brain development, causing problems in behavior, communication, and social interaction. It's a neurological disorder. Although there is currently no approved cure for autism, children have made great strides with early treatment and productive educational efforts [1]. ASD is usually discovered and clinically identified by the age of 3-4 years. [2,3,4]. Autism is characterized by three symptoms: communication in spoken and non-spoken language [6, 7],human involvement due to difficulties in recognizing and communicating one's emotions[5,6], and related adaptation. Restricted or repetitive movement patterns associated with a new language. environment [5, 6]. Autism spectrum disorders cause delays in speech and language development. Children with all of the following conditions may have difficulty learning new material and participating in classroom activities if the disease is not treated and diagnosed early. [7]. It typically starts in infancy and lasts into puberty and maturity. While some of her ASD sufferers can live independently, others face significant challenges and require ongoing support and care. [8] Although some people with autism spectrum disorders also have intellectual disabilities, most have average or above-average IQs [9]. By enhancing communication, promoting

independence, and fostering social relationships, assistive skills such as reasoning and appropriate communication may benefit people with autism [8].

II.CAUSES OF ASD:

Although there is evidence that genes and the environment are important factors, scientists are still unaware of the specific origin of ASD. Genes that may increase the risk of ASD are slowly being discovered by researchers. People with certain genetic disorders, such as tuberous sclerosis and fragile X syndrome, Down syndrome, and Rett syndrome, develop ASD. more likely to develop. Many scientists look at how genes combine with family medical problems, parental age and other demographics, and environmental conditions such as difficulties during childbirth and pregnancy. There is currently no scientific evidence between vaccines and autism spectrum disorders (ASD) [10]. Premature birth and older parental age are two other major risk indicators for ASD [11,12,13]. This is related to the hypothesis concluded that older gametes are more likely to carry mutations that may proceed to further obstetric consequences such as preterm birth [14]. There is no doubt that certain illnesses during childbirth, for example, rubella, raise the chance of Autism spectrum. Nevertheless, there is not much proof that viral illnesses common present day, such as the flu during pregnancy, significantly increase the risk of ASD. Signals can be subdued due to genetic influences of the environment, as is the case in certain mouse strains [15,16]. If so, the evidence must come from studies that combine sophisticated genomic analysis with large-scale epidemiology. May change human risk [17]. Additionally, there is evidence that the risk of ASD increases with shorter and longer intervals between pregnancies [18]. Studies [12] show that premature babies are more likely to suffer from autism and various neurodevelopmental disorders. Previous epidemiological analyses have found that obstetric considerations such as uterine bleeding, C-Section, low infant birth weight, premature birth, and childbirth are responsible. Low Apgar scores were some of the indicators more related to autism [19]. Older parents are more likely to have children with ASD [20]. Early findings have important implications for social workers and other mental health professionals about how they see and act on the challenges faced by people with ASD.

III.BRAIN GROWTH IN ASD, STRUCTURE, AND CONNECTIVITY RELATIONSHIPS:

Head circumference measurements in autistic infants provided one of the foremost hints of abnormal brain development amidst ASD. In the initial postnatal period, head circumference has been suggested as a valid predictor of relative brain size [21]. These studies provide important preliminary evidence that both overgrowth and overgrowth exist in Autism spectrum disorder. Many explorations have found that kids with ASD had abnormally enlarged heads at the time of symptom diagnosis [22,23]. A new analysis looked at the size, shape, and structure of cells in the brains of individuals with ASD. Investigators generally favored the amygdala growth theory and also offered several explanations [24]. Unlike patients with autism and her AS, patients without autism showed amygdala activity in making mental judgments from vision. It has therefore been suggested that one of several brain regions that are dysfunctional in autism is the amygdala [25]. They showed that different regions of the brain express these differences. This is more important than anything else. These regions of the brain include the nucleus accumbens, associated with motivation and reward for actions such as social engagement, the amygdala, which helps execute complex movements, and the cerebellum. This may help explain the unique behavioral characteristics associated with ASD. An early study that needed confirmation found that some people with autism had elevated levels of the protein amyloid beta, which is associated with Alzheimer's disease [26]. This protein is responsible for the plaques and tangles accompanied by Alzheimer's disease indications. Although no relationship between autism and Alzheimer's disease has been turned out, the existence of Alzheimer's protein in the brains of autistic people may indicate early condition and clues [27].

IV.CATEGORIES OF AUTISM SPECTRUM DISORDERS:

Autism spectrum disorders are categorized into three groups. When people hear the word "autism," they typically envision that people autistic people typically exhibit bizarre habits and obsessions, significant language impairment, and communication and social difficulties. Many autistic people also have intellectual restrictions.

4.1ASPERGER'S DISORDER:

People with Asperger's Disorder have fewer severe symptoms of autism. They have social hardships and exhibit strange habits and interests. But won't usually struggle with either communication problems or intellectual disabilities

4.2PERVASIVE DEVELOPMENTAL DISORDER(PDD):

No other definable incomplete developmental disorder. This syndrome is often referred to as 'a typical autism' or 'pervasive developmental disorder'. People who partially or incompletely meet the criteria for an autistic condition or Asperger's syndrome can be diagnosed with normal autism.. These people have few symptoms than autistic people. Some disorders can make communication and relate to others difficult.[31]

V.INDICATOR:

Difficulty understanding other people's emotions or expressing themselves, with limited speech and language skills (eg, children with autism). It uses the term much later than its siblings. B. Peering, or communicating without words. Repeating words or phrases Giving irrelevant answers to questions. Disturbed by minor routine changes (eg getting a new toothbrush). Having obsessive hobbies (such as collecting rare books). There is a high level of interest in less congested trains. He or she may flap his arms, rock his body, or spin in place. Use and play with items in unique ways. By spinning in circles or standing in line. Strange reactions to sounds, breathing, taste, sight, and touch of objects [28].

VI.SYMPTOMS OF AUTISM IN CHILDREN:

There is no conclusive evidence of autism. Often a child may exhibit numerous signs from the various categories listed.

VII.TRAITS:

This leads to irrational outbursts, display of abnormal passions and obsessions, and exhibits peculiar motor behaviors such as B. Flapping and twisting of hands and great difficulty accepting change.

VIII.SENSES:

Fear of some common sounds, checking objects out of the corner of the eye, interest in moving objects, increased discomfort, and sensitivity to heat.

IX.INTERACTION:

You have not gestured or responded to your name in 365 days. Loss of formerly used words, lack of oration at 546 days, lack of impulsive writing at 2 years, selective hearing that responds to some sounds but ignores human speech, abnormal All speech patterns are signs of language development (e.g.G. Repeated utterances) [29].

X.EPIDEMIOLOGY:

Autism is usually first detected in young children. Developmental pediatricians, psychiatrists, and psychologists are trained and qualified to assess individuals with autism spectrum disorder and can diagnose ASD in children as young as 2 years of Age, but age-related can be determined without Surveys, standardized trials or surveys, and conversations with patients, patients families, and support suppliers are part of the evaluation. It identifies what an individual does and struggles with, particularly in the stream of social contact and relation, auditory processing, and restricted and recurrent interests, action, and ethics. Autism cannot be diagnosed by a single behavior. There is currently no blood test that can identify the effect of autism [30].

XI.ASD MEDICATION INCLUDE:

Beforehand diagnosis and appropriate care can reduce user challenges and increase the ability to leverage one's strengths and abilities and improve new skills. Close collaboration with physicians is essential for ASD, even though there is no optimal treatment. The process of selecting the optimal dosing regimen [31].

XII.AUTISM AND FOLIC ACID INADEQUACY IN KIDS:

In children with autism, folic acid is not shown to be transmitted to the nervous system from infancy[32]. Twenty-nine autistic people were tested to see how folic acid affected the methylation cycles and oxidative strain. Studies conducted on children with ASA have concluded that taking folic acid supplements may be beneficial for children with ASA due to improved social behavior, cognition, and communication. One study found that treating nutritional deficiencies and giving high doses of Folic acid to people with autism spectrum disorders improved symptoms[33].

XIII.CONCLUSIONS:

In summary, ASD being a neurobehavioral disorder that breaks the ability to socialize, communicate with people. The main symptoms and indicators of autism were discussed throughout the study. These symptoms were classified according to how they affect cognition, communication, and behavior. Various forms of autism in the Autism Spectrum have been defined, along with the characteristics and abilities associated with each type. Socializing and conversing with a 'social semi-humanoid robot' has been proposed as a technological technique that improves social and communication skills in autistic people. Moreover, there are still certain flaws that must be addressed. There are many areas of autism research. Autism case studies demonstrate the value of social support for individuals having ASD and their race.

REFERENCES:

1. Aysha Faraj AL Dawodi, Sarah Faisal Alzahrani, Reema AbdulkareemAlmumtin, Sarah Saeed Alshyban, MuneerahAlshabanah, DaniahAlrajhi, Mutasem K. Alsmadi and Ibrahim Almarashdeh- Developing and Implementing an Online Learning Platform for Children with Autism- 2020 | International Journal of Scientific Research in Science and Technology IJSRST | Volume 7 | Issue 2 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X DOI : https://doi.org/10.32628/IJSRST207162

2.Le Couteur A. National autism plan for children. London: National Autistic Society, Royal College of Psychiatrists, Royal College of Paediatrics and Child Health, and the All Party Parliamentary Group on Autism; 2003. 12.

3.Glasson EJ, MacDermott S, Dixon G, Cook H, Chauvel P, Maley-Berg A, Wray J. Management of assessments and diagnoses for children with autism spectrum disorders: the Western Australian model. Med J Aust. 2008;188(5):288–91. 13.

4.Bent CA, Dissanayake C, Barbaro J. Mapping the diagnosis of autism spectrum disorders in children aged under 7 years in Australia, 2010–2012. Med J Aust. 2015;202(6):317–20

5.I. N. N. A. Azahari, W. F. W. Ahmad, Z. Jamaludin, and A. S. Hashim, "The design of mobile social application for children with autism," in 2016 3rd International Conference on Computer and Information Sciences (ICCOINS), 2016, pp. 547-552

6.T. Banaschewski, S. Cho, J. Deckert, S. Durston, D. Hay, R. Klein, M. Muenke, F. Reimherr, M. Roesler, and L. Rohde, "ADHD attention deficit and hyperactivity disorders," 2009

7.A. Hussain, A. Abdullah, and H. Husni, "The design principles of edutainment system for autistic children with communication difficulties," in AIP Conference Proceedings, 2016, p. 020047.

8. WHO (2019) Autism spectrum disorders. Retrieved May 12, 2019, from https://www.who.int/news-room/fact-sheets/detail/autism-spectrum-disorders.8

9.Spitzer RL, Williams JB. American Psychiatric Association (APA) Diagnostic and Statistical Manual of Mental Disorders. revised. DSM III R APA Washington DC: APA. 1987:47-217.

10.Fernandes FD, Molini-Avejonas DR, Amato CA. Language Therapy with Children with Autism Spectrum Disorders. A Comprehensive Book on Autism Spectrum Disorders. 2011 Sep 15:23

11.Durkin MS, Maenner MJ, Newschaffer CJ, et al. Advanced parental age and the risk of autism spectrum disorder. *Am J Epidemiol* 2008;168:1268-76. 10.1093/aje/kwn250

12. Agrawal S, Rao SC, Bulsara MK, et al. Prevalence of autism spectrum disorder in preterm infants: a meta-analysis. *Pediatrics* 2018;142:e20180134. 10.1542/peds.2018-0134

13. Wang C, Geng H, Liu W, et al. Prenatal, perinatal, and postnatal factors associated with autism: a meta-analysis. *Medicine (Baltimore)* 2017;96:e6696. 10.1097/MD.0000000000006696

14. Parner ET, Baron-Cohen S, Lauritsen MB, et al. Parental age and autism spectrum disorders. *Ann Epidemiol* 2012;22:143-50. 10.1016/j.annepidem.2011.12.006

15. Schwartzer JJ, et al. Behavioral impact of maternal allergic-asthma in two genetically distinct mouse strains. *Brain BehavImmun* 2016

16. Schwartzer JJ, et al. Maternal immune activation and strain specific interactions in the development of autism-like behaviors in mice. *Transl Psychiatry.* 2013;3:e240.

17.Wang C, Geng H, Liu W, et al. Prenatal, perinatal, and postnatal factors associated with autism: a meta-analysis. *Medicine (Baltimore)* 2017;96:e6696. 10.1097/MD.0000000000006696 [CrossRef]

18.Schieve LA, Tian LH, Drews-Botsch C, et al. Autism spectrum disorder and birth spacing: findings from the study to explore early development (SEED). *Autism Res* 2018;11:81-94. 10.1002/aur.1887

19.Newschaffer CJ, Croen LA, Daniels J, et al. The epidemiology of autism spectrum disorders. *Annu Rev Public Health* 2007;28:235-58. 10.1146/annurev.publhealth.28.021406.144007

20. Croen LA, Najjar DV, Fireman B, et al. Maternal and paternal age and risk of autism spectrum disorders. *Arch PediatrAdolesc Med* 2007;161:334-40. 10.1001/archpedi.161.4.334

21.Bartholomeusz HH, Courchesne E, KarnsCM.Relationship between head circumference andbrain volume in healthy normal toddlers, children, and adults. Neuropediatrics. 2002 Oct;33(05):239-41.

22.Courchesne E, Carper R, Akshoomoff N. Evidence of brain overgrowth in the first year of life in autism.Jama. 2003 Jul 16;290(3):337-44.

23. Courchesne E, Pierce K, Schumann CM, Redcay E, Buckwalter JA, Kennedy DP, Morgan J. Mappingearly brain development in autism. Neuron. 2007 Oct 25;56(2):399-413.

24.Wegiel J, Flory M, Kuchna I, Nowicki K, Ma SY, Imaki H, Wegiel J, Cohen IL, London E,Brown WT, Wisniewski T. Brain-region–specific alterations of the trajectories of neuronal volumegrowth throughout the lifespan in autism. Acta neuropathological communications. 2014 Dec;2(1):28.

25. Adolphs R, Spezio M. Role of the amygdala in processing visual social stimuli. Progress in brainresearch. 2006 Jan 1;156:363-78

26.Wegiel J, Frackowiak J, Mazur-Kolecka B, Schanen NC, Cook Jr EH, Sigman M, Brown WT,Kuchna I, Wegiel J, Nowicki K, Imaki H. Abnormal intracellular accumulation and extracellular Aβdeposition in idiopathic and Dup15q11. 2-q13 autism spectrum disorders. PLoS One. 2012 May2;7(5):e35414.

27. Starkstein S, Gellar S, Parlier M, Payne L, Piven J. High rates of parkinsonism in adults with autism.Journal ofneurodevelopmentaldisorders. 2015 Dec;7(1):29

28. Sandin S, Hultman CM, Kolevzon A, Gross R, MacCabe JH, Reichenberg A. Advancing maternal age is associated with increased risk for autism: a review and meta-analysis. Journal of the American Academy of Child & Adolescent Psychiatry. 2012 May 1;51(5):477-86.

29.Abbeduto L, Seltzer MM, Shattuck P, Krauss MW, Orsmond G, Murphy MM. Psychological well-being and coping in mothers of youths with autism, down syndrome, or fragile X syndrome. American Journal on Mental Retardation. 2004 May;109(3):237-54.

30. Brugha TS, McManus S, Bankart J, Scott F, Purdon S, Smith J, Bebbington P, Jenkins R, Meltzer H. Epidemiology of autism spectrum disorders in adults in the community in England. Archives of general psychiatry. 2011 May 2;68(5):459-65.

31. MacFabe DF, Cain DP, Rodriguez-Capote K, Franklin AE, Hoffman JE, Boon F, Taylor AR, Kavaliers M, Ossenkopp KP. Neurobiological effects of intraventricular propionic acid in rats: possible role of short chain fatty acids on the pathogenesis and characteristics of autism spectrum disorders. Behavioral brain research. 2007 Jan 10;176(1):149-69.

32. Ramaekers VT, Blau N, Sequeria JM, Nassogne MC, Quadros EV. Folate receptor autoimmunity andcerebral folate deficiency in low functioning autism with neurological defects. Neuropediatr. 2007; 38(6):276-81.

33. Sequeira JM, DiDuca M, Vrancken G, Thomas A,Philippe C, Peters M, et al. Improving Outcome in Infantile Autism with Folate ReceptorAutoimmunity and Nutritional Derangements: A Self-Controlled Trial. Autism Res Treatment. 2019