Autism Spectrum Disorder: Review Article

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Abstract

Autism is a lifelong neuro developmental condition. It is characterised by differences in behavior, social interaction, communication, special interests and sensory processing. These differences can present people on the autism spectrum with challenges in how they interact with their environment.

Some people on the autism spectrum may behave in non-typical ways, often in response to the different ways in which they experience their environment. Such behaviors are generally a way to communicate their feelings or to adapt to a situation, or may result from their heightened sensitivity to a sound or something they have seen or felt.

The researchers suggest that genes and environment play important roles in the causing of ASD. A more recent study examined the cell structure, size, and shape of the brains of individuals with ASD, they demonstrated that different brain regions showed these differences more profoundly than others. The amygdala is therefore proposed to be one of several neural regions that are abnormal in autism, and may associated with other neurodisorders. There are several types of ASD according to the development of disease. While there is no single best treatment for ASD. There are association between the child's diet and severity or frequency of symptomatology; especially vitamin D, calcium, potassium, pantothenic and choline may persist in a significant percentage of patients. Types of playing are very successful and designing appropriate play opportunities for children with ASD need to be the primary concerns for educators, clinicians, and parents.

Keywords: *Autism, disorder, spectrum, amygdala, brain.*

Introduction

Autism Spectrum Disorder: Autism spectrum disorder (ASD) is a term for a group of developmental disorders described by:

- Lasting problems with social communication and social interaction in different settings
- Repetitive behaviors and/or not wanting any change in daily routines
- Symptoms that begin in early childhood, usually in the first 2 years of life
- Symptoms that cause the person to need help in his or her daily life.

The term "spectrum" refers to the wide range of symptoms, strengths, and levels of impairment that people with ASD can have.

Although ASD begins in early development, it can last throughout a person's lifetime(1).

ASD affects many people, and it has become more commonly diagnosed in recent years. More boys than girls receive an ASD diagnosis(2).

Autism is a lifelong neurodevelopmental condition. It is characterized by differences in behavior, social interaction, communication, special interests and sensory processing. These differences can present people on the autism spectrum with challenges in how they interact with their environment.

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Some characteristics of autism are common to a greater or lesser extent among many people on the autism spectrum; other characteristics are typical but not necessarily experienced by all people on the autism spectrum..

While some people on the autism spectrum also have an intellectual impairment or disability, many others have average intelligence, while others have above-average intelligence[3].

Reasons of ASD: Scientists don't know the exact causes of ASD, but research suggests that genes and environment play important roles.

- Researchers are starting to identify genes that may increase the risk for ASD.
- ASD occurs more often in people who have certain genetic conditions, such as Fragile X syndrome or tuberous sclerosis.
- Many researchers are focusing on how genes interact with each other and with environmental factors, such as family medical conditions, parental age and other demographic factors, and complications during birth or pregnancy.
- Currently, no scientific studies have linked ASD and vaccines[4].

Brain Growth, Structure, and Connectivity in ASD: One of the earliest indications of aberrant brain growth during development in ASD came from measurements of head circumference among infants and young children with autism. Head circumference is posited as a reliable proxy for relative brain size during early postnatal ages[5]. These studies have provided important initial evidence for the presence of both over- and under-growth in ASD. Many studies have shown head circumference to be abnormally enlarged in children with ASD around the age of symptomatic diagnosis [6,7].

A more recent study examined the cell structure, size, and shape of the brains of individuals with ASD. The researchers agreed with amygdala growth theory in principle, but added some details[8].(Patients with autism or AS did not activate the amygdala when making mentalistic inferences from the eyes, whilst people without autism did show amygdala activity. The amygdala is therefore proposed to be one of several neural regions that are abnormal in autism)[9]. They demonstrated that different brain regions showed these differences more profoundly than others. These brain regions include the cerebellum, which contributes to the execution of complex motor movements; the nucleus accumbens, which is associated with motivation and reward for behaviors including social interaction; and the amygdala. This might explain the specific behavioral features seen in ASD.

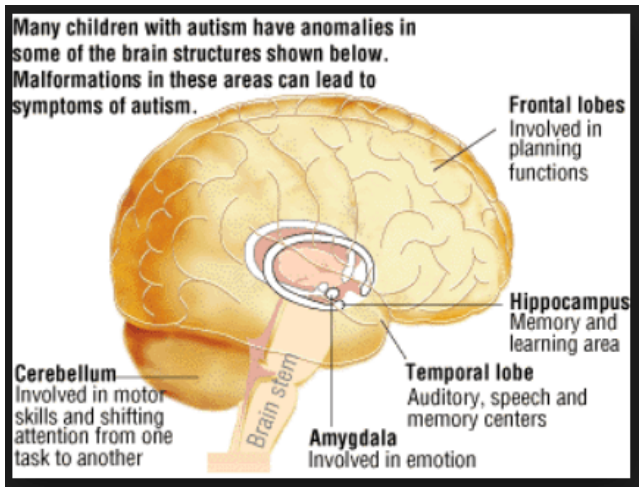

Fig. 1. The functions of different brain regions

These findings may not just be limited to autism-related pathology and autism symptoms. Early findings, which need to be replicated, reported an increase in the Alzheimer's disease-associated protein, Amyloid beta, in some individuals with autism[10].

This is the protein that leads to the plaques and tangles associated with Alzheimer's symptoms. While the link between Alzheimer's disease and autism has not been determined, the presence of this protein in the brains of people with autism may signal early signs and symptoms[11].

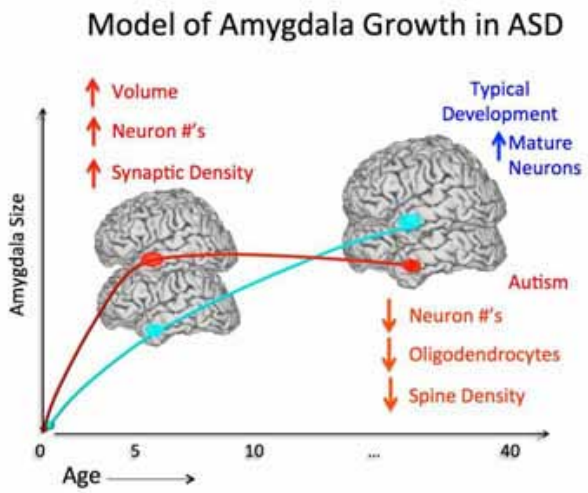

Fig. 2: Model of Amygdala Growth in ASD

Signs and Symptoms:

A child with ASD might:

- Avoid eye contact and want to be alone.
- Have trouble understanding other people's feelings or talking about his or her own feelings.
- Have delayed speech and language skills (for example, use words much later than siblings or peers or not use words to communicate).
- Repeat words or phrases over and over.
- Give unrelated answers to questions.
- Get upset by minor changes in routine (for example, getting a new toothbrush).
- Have obsessive interests (for example, having a very strong interest in trains that is difficult tointerrupt).
- Flap his or her hands, rock his or her body, or spin in circles.
- Have unusual ways of playing with or using objects, such as spinning or lining them up repeatedly.
- Have unusual reactions to the way things sound, smell, taste, look, or feel[12].

Symptoms of autism in children: No single indicator necessarily signals autism – usually, a child will present with several indicators from some of the following categories:

Behaviors:

- Has inexplicable tantrums
- Has unusual interests or attachments
- Has unusual motor movements such as flapping hands or spinning
- Has extreme difficulty coping with change.

Sensory

- Afraid of some everyday sounds
- Uses peripheral vision to look at objects
- Fascination with moving objects
- High tolerance of temperature and pain .

Communication:

- Not responding to his/her name by 12 months
- Not pointing or waving by 12 months
- Loss of words previously used
- Speech absent at 18 months
- No spontaneous phrases by 24 months
- Selective hearing – responding to certain sounds but ignoring the human voice
- Unusual language patterns (e.g. repetitive speech)[13]

Diagnosis: Autism is usually diagnosed in early childhood Young children with ASD can usually be reliably diagnosed by age 2, but can be done at any age by developmental paediatricians, psychiatrists and psychologists who are qualified and experienced in assessing people on the autism spectrum. An assessment includes observations, standardised tests or questionnaires, and meeting with the individual, their family and service providers. Information is gathered about the individual's strengths and difficulties, particularly in the areas of social interaction and social communication, sensory processing, and restricted and repetitive interests, activities and behaviours. There is no single behaviour that indicates autism. Currently, there are no blood tests that can detect autism[14].

The treatments for ASD: Treating ASD early and getting proper care can reduce a person's difficulties and increase his or her ability to maximize strengths and learn new skills. While there is no single best treatment for ASD, working closely with the doctor is an important part of finding the right treatment program[4].

Types of Autism Spectrum Disorders

There are three types of autism spectrum disorders:

Autistic Disorder: This is sometimes called "classic" autism. It is what most people think of when hearing the word "autism". People with autistic disorder usually have significant language delays, social and communication challenges, and unusual behaviors and interests. Many people with autistic disorder also have intellectual disability.

Asperger Syndrome: People with Asperger syndrome usually have milder symptoms of autistic disorder. They might have social challenges and unusual behaviors and interests. However, they typically do not have problems with language or intellectual disability.

Pervasive Developmental Disorder – Not Otherwise Specified: This is sometimes called "atypical autism," or PDD-NOS. People who meet some of the

criteria for autistic disorder or Asperger syndrome, but not all, may be diagnosed with atypical autism. These people usually have fewer and milder symptoms than those with autistic disorder. The symptoms might cause only social and communication challenges[16].

Nutrition and the development of ASD: A number of parents or professionals working with children having one of the autism spectrum disorders have noted an association between the child's diet and severity or frequency of symptomatology; with different mechanism proffered in the explanation of this association[21]. There have also been suggestions that food additives or food substances may play important roles in the etiology of ASDs; and recently, animal studies have demonstrated that propionic acid (PA), a dietary short chain fatty acid and common food additive induces neuroinflammatory responses and a number of behavioral changes in rats that are similar to that observed in ASD. The alteration in behavior, as well as neuropathological and biochemical effects of intraventircular administration of PA[16,17] also increased support for the hypothesis that autism may be a systemic metabolic encephalopathy[18]. The children with ASD were found to consume significantly fewer foods on the average, compared to normally-developing children. They were also found to have taken lower amounts of protein, calcium, vitamin B12 and vitamin D[19]. Deficits in vitamin D, calcium, potassium, pantothenic and choline may persist in a significant percentage of patients, despite intake of nutritional supplements[20]

Play in Children with ASD: Introducing play and designing appropriate play opportunities for children with ASD need to be the primary concerns for educators, clinicians, and parents. Playing with others requires multiple skills, especially social skills. Through social play, children with autism learn about social interaction. Therapeutic and educational play settings should be designed to provide long-term learning processes. Before they can correctly express emotions in daily life, children with ASD need to learn to understand emotions and recognize them and their meaning. For this reason, emotional recognition and theory of mind are frequently taught to these children before work can begin to improve play for the sake of play[21]. In play situations, the child will be confronted with many different emotions and varied ways to express them, requiring direct application in everyday life contexts. Role-playing then seems a more appropriate tool for matching learnt social interactions to real life[22], many children with ASD, 'banging a doll' or 'pouring sand in different containers' are activities that require directed and skilled actions and could be considered a form of play, as well as an occupation for its own sake[23] We can also note that other types of play are very successful in leisure time, for instance, those related to new technologies. One of their advantages is their attractiveness [24,25]. In fact, touch screens or playful interfaces are all assets that stimulate children's motivation. Moreover, the programmed, predictable, and emotionally neutral environments of new technologies are particularly appreciated by children with ASD[25,26].

Conclusions

Developmental monitoring is important for all young children from birth to age 5 years. Caregivers, such asparents, healthcare providers, and early educators, should be aware of developmental milestones—how childrengrow, move, communicate, interact, learn, and play. This information helps caregivers know what to expect, get ideas on how to promote positive development, and be aware of potential concerns about development as early aspossible. Developmental monitoring is an ongoing process, and"Learn the Signs. Act Early.".

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