

The ability to detect autism early and try to prevent it

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Abstract

Autism spectrum disorder (ASD) is a neurological disorder with unknown causes; it may be genes and environment factor, that both play important role in development of autism. It can be diagnosed at any age, so it is a developmental disorder which affects person act, interact, behavior, and communication with others. Autism is called a spectrum disorder because has a range of symptoms different from person to other and each one has his own world. It is a lifelong disorder where the symptoms of autism begin early in childhood; usually appears in the first two years of life and lasts with person's life. There is no standard treatment of autism, but detecting it early will lead to better results. At this research we will study the biological basis of autism and how can be detected at early stages prior to age 12 months. This study will depend on examining the gene expression pattern, early bio-markers related to early brain overgrowth, and cerebellar development to the infants less than 12 months to detect the autism early and help to control the symptoms. Early treatment of autism will improve the brain structure, function and behavior. Also, it will prevent the person from having autism all his life.

Keywords: Autism, autism spectrum disorder, bio-markers, gene expression, spectrum disorder, early detection.

Introduction

Autism is a mental disorder; person with autism spectrum disorder (ASD) has difficulty to interacting and communicating with other people, has a restriction interests and repetition behaviors. Also, he can't function properly at all things of his life. The symptoms are spectrum and different from one to the other. These symptoms like having a problem to talking with people, don't look at the eye during conversation with others, tending not to listen to people, slowing at responses and to give an attention, repeating certain behaviors several times or say the same word or sentence again and again, spending a lot of time to putting things in order, having intense interest to something like numbers, be very upset if happen a slight change to his daily routine. Although person with autism has a several socials and communication problems, but may have some strengths such as be able to learn things in details and don't forget the information, excellent at math, science, and music (Johnson, 2004).

The cause of autism is unknown; the previous studies don't know the exact cause of autism and suggest that genes can act together with the effect of surrounded environment in development of autism spectrum disorder (ASD). Also, the scientist discovered that there are some risk factors which may lead to develop autism at some people and others not affected. The people with genetic condition such as Down syndrome, fragile X syndrome, and Rett syndrome are at risk to developing autism. Also, autism can be developed at very low birth weight or having older parents. Autism is diagnosed by looking to a behavior of the person; it is usually detected at age of two. But some researches reveal that autism can be diagnosed at early stage prior to 12 months, so at this study we will discuss the ability to detect autism spectrum disorder (ASD) early, ways of treatment, and prevent autism from development (Masi, DeMayo, Glozier, & Guastella, 2017).

The study problem

Autism spectrum disorder (ASD) is a neurological and developmental disorder. It has a communication, behavioral and social challenges. The symptoms of autism may be mild, moderate or severe. It begins with childhood and last with all life. There is no treatment of autism, but early diagnosis plays an important role and makes a great difference. So at this study we will discuss the ability to detect autism early prior to age 12 months and how can prevent autism from development.

This research will answer the following questions:-

- 1- What are bio-markers in autism?
- 2- Why is it important to detect autism early?
- 3- Can we detect autism early prior to age of 12 months?
- 4- What are methods of diagnosis autism early?
- 5- What are the plan of autism treatment and prevention it from development?

What distinguishes this study from previous studies

The previous studies deal with autism as a disorder with no treatment and when it is diagnosed at the age of two, it can be controlled by skills training, behavioral therapy and medications to decreasing the symptoms. Here, it will illustrate the ability to diagnosis autism spectrum disorder early prior to age of 12 months, the ways of the diagnosis, and the methods of preventing autism from development. So autism can be treated, the symptoms will be disappeared, the person will be normal, and will have a natural behavior with other people.

The study content

1. The bio-markers in autism spectrum disorder (ASD)

Autism spectrum disorder (ASD) is a complex and heterogeneous disorder; it is due to an interaction between genes and environmental factor,

knowing the roots of autism will help in the diagnosis and treatment. So the effort to identify bio-markers in autism will play an important role in detection autism early, treatment, and prevent its development. The bio-markers in autism include the following:

1.1 Genetic bio-markers

It is founded that there are over 500 genetic loci may be related to autism, some of these genetic mutation are SNC2A, CHD8, GRIN2B, POG2, DYRKIA, and KATNAL2 (Ratajczak, 2011).

1.2 Metabolic bio-markers

There are different metabolic abnormalities that can lead to autism; these metabolic abnormalities are biotinidase deficiency, phenylketonuria (PKU), creatine deficiency, cerebral folate deficiency, and excess propionic acid (Lowe, Tanaka, Seashore, Young, & Cohen, 1980).

1.3 Environmental bio-markers

Environmental toxicant like aluminum, lead, mercury and arsenic may be found in the person with autism, and studies reveal that pesticides, solvents, toxic waste, air pollutants and heavy metals lead to development of autism spectrum disorder (ASD) (Frye et al., 2013).

1.4 Others bio-markers

1.4.1 Oxidative stress

The person with autism suffers from a poor oxidation status due to the ratio of reduced glutathione to oxidized glutathione is decreased, and redox abnormalities will lead to the development of autism spectrum disorder (Oliveira et al., 2005).

1.4.2 Mitochondrial dysfunction

Mitochondrial dysfunction is a common dysfunction found in autism and the person with autism will suffer from impairment energy production (Deth, Muratore, Benzecry, Power-Charnitsky, & Waly, 2008).

1.4.3 Methylation

The person with autism suffers from less methionine and less methylation; it leads to neurological deficits and abnormal behaviors (Ashwood, Wills, & de Water, 2006).

1.4.4 Immune dysregulation

Cytokine is elevated at brain of person with autism. Also, there are chronic inflammation and microglia cell activation (Singh, 2009).

1.4.5 Autoimmunity and maternal antibodies

There are many autoantibodies found in the nervous system of person with autism, this autoimmunity plays a role in the social and communication developmental abnormalities.

Also, some researches indicate that the viral and bacterial infections during pregnancy will release maternal antibodies which will cross the blood brain barrier of the fetus and cause neurological deficits (Singh, 2009).

2. Early detection of autism

Autism spectrum disorder (ASD) is a lifelong disorder, but if it is diagnosed early, the treatment and behavior therapy can improve the symptoms and the person with autism can act normally with all areas of his life. So it is preferred to screening all children prior to age of 12 months for autism, this screening is carried out by two stages, first stage is general developmental screening and the second stage is additional evaluation.

2.1 General developmental screening

All children are screened for developmental delays at their 6, 9 and 12 months, the children who are detected with developmental problems will be referred to the additional evaluation.

2.2 Additional evaluations

Additional evaluation will be done to the children with developmental problems, and further investigation such as bio-markers in autism detection, magnetic resonance imaging, and electroencephalography will be done to the children who are susceptible to having autism (Bryson, Rogers, & Fombonne, 2003).

3. Treatment and therapies of autism

Treatment must begin immediately after diagnosis. Early treatment is very important to reduce the person difficulties and help them to act normally with others.

3.1 Medications

Physician may use medications to control symptoms of autism such as aggression, hyperactivity, attention problems, depression, and anxiety.

3.2 Psychological, educational, and behavioral therapies

This is a highly structured program that help person with autism to learn social, communication, languages skills. It helps him to live independently and be a normal person (Bryson et al., 2003).

The results of the study

Autism spectrum disorder (ASD) is a developmental disorder. It can be treated and prevented from development with the person's life when it is diagnosed early prior to the age of 12 months and begin the treatment as soon as possible. The diagnosis will be done by general developmental screening and additional evaluation. It will be confirmed with the bio-markers in autism and by investigation on the brain. The early detection of autism will cause a big difference and lead to a better results. The symptoms will be controlled with medications and the person behavioral will be improved by psychological, educational, and behavioral therapies. Treatment and therapies will be continued till the complete improvement from the autism symptoms and the person looks normal.

The suggestions

1- All children are screened at health care centers for developmental delays at their 6, 9 and 12 months.

2- Additional evaluation will be done to the children with developmental problems; this evaluation will be carried by a team of health professionals in diagnosing the autism.


2- Treatment and therapies of autism must be beginning immediately after diagnosis to get better results and all people related to the person of autism and deal with him must be contributed in the treatment plan.

The conclusion

We have the ability to detecting autism early and preventing it from development. It is not a difficult method and can be carried to all children prior to the age of 12 months at the health care center. Autism spectrum disorder (ASD) can be treated easily if it is diagnosed at early stage and we may have a world with no autism.

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