

Underlying Mechanisms of Autism Spectrum Disorder and Its Complex Consequences.

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Abstract:

Autism spectrum disorder is not a single disease. It is a complex consequence of a neurological developmental disorder. It is accompanied by improper development of certain regions of the brain. It affects behavior, speech, understanding, thinking, perception, and overall development. In this article, we will reveal the underneath of autism spectrum disorder and complex consequences. In most cases, we might have observed ADHD and Seizure co-occur with autism spectrum disorder. We aim to explore the possible causes, symptoms, and etiology of autism spectrum disorder.

Key words: neurological disorder; ADHD, seizure; nutritional deficiency; maternal stress during pregnancy; microglial cell

Introduction

Autism Spectrum disorder is a consequence of complex pattern of neurological development. It is not a disease, that we can address it and recover with medicine. It is a complex phenomenon which takes place in our brain. Almost all autistic people exhibit less or no eye contact at all. This is the core symptom of autism. Sometimes people interfere speech delay with autism, whereas these two mechanisms work completely different way. We can expect a totally different brain function and structure of autistic Person in Brain fMRI scan. It may affect the brain volume- gray matter or white matter, size or shape of amygdala, impaired neural network connectivity. Chronic activation and dysfunction of microglial cells, neuro-inflammation may lead to synaptic pruning. In autism, people do not have eye contact and it doesn't mean that they do it intentionally. It depends upon so many factors like discomfort, trigger of sensory overload, stress, anxiety, hypo-sensitivity of sensory receptors. No single Chromosome is exclusively responsible for autism. However, research evidence shows that there may be potential association in between X chromosome, chromosome 15 and chromosome 7. However, Scientists have identified few genes contributed to autism like-ADNP, ANK2, ARID1B, ASH1L, CHD2, CHD8, CTNND2, and DYRK1A. In my clinical experience, I have observed that Autism, ADHD and Seizure

take place concurrently. It could be a major point to be noted. It is because of overlapping feature of all three mechanisms. Sometimes sharing similar genetic mutation like SHANK3, SYN1, GABRG1, could be another cause. Well, not all autistic people have ADHD or Seizure episode. Few may face Autism and ADHD and few may experience internal or external seizure episode with Autism. Few may experience all three phenomena together. Research evidence shows that an Extrovert autistic person has the tendency to develop ADHD symptoms. Even I have observed it in my clinic. When an autistic person has ADHD feature, he/she speaks a lot themselves and cannot sit quiet in one place. It is called as AuDHD. Scientists observed that people with IQ below 70, experience Seizure episode with autism spectrum disorder. However, it is not a norm to predict about seizure episode in autism. People with IQ above 70, may also experience seizure episode with autism. It depends upon so many factors like low sugar level, hypernatremia, hyponetromia, meningitis, tumor, abnormal electrical activity and so on.

Causes of Autism: Several factors with associated with etiology of Autism. We would like to list out as follows:

1. **Genetic Predisposition:** We have the tendency to develop it inherently and when other factors like environment and lifestyle

fuels it, we develop it. It may be predisposed single pathways to multifaceted complex pattern, which grows systematically.

2. **Parental age:** Parents age does play an extreme rule in fetus formation and development. Everything has a timing and fresh start up. As we age, sperm and egg quality declines and many factors like hormone, DNA integrity, morphology- all these factors affect the fetus and its all-round development also get affected. Mostly disorders like Schizophrenia, Down syndrome, and autism –all are suspected to be correlated with parental age. Well, reverse situation is also observed in certain cases- like elderly parents deliver more mature, understanding and knowledgeable baby.
3. **Maternal health during pregnancy:** Maternal stress is another important cause of autism. In one case study, mother had poor mental and physical health during pregnancy. When she was 7 months pregnant, her in-laws decided to send her back to her parents' house. She might not have taken good care of her mental and physical health. Then she delivered a baby boy in C-section. After his birth, again she was facing same mental trauma. When the baby was 9 months' old, she had joined in college as lecturer. She was leaving her 9 month's old baby boy with care taker and all the time he was listening music. Nobody had time to spend with that little baby. He was all the time busy watching music. Everything was going normal. When he became 3 years old and no word was coming from him, they got alarm. They consulted with Psychiatrist and he was diagnosed with ADHD and Autism. Even, I too observed him and diagnosis was same. This baby boy soon lost interest in other things and no eye contact was there. Whenever his name was pronounced, response was coming as music. Until 1 year of age, everything was going normal. Well, this baby had no control on food. This baby boy belongs to a family, where food is passion. He could eat anything from anyone. He could give response only to his parents. However, he could follow other and grasp anything easily. He was showing good response with speech therapy. All the time saliva was coming from his mouth. He was experiencing internal Seizure episode. It was noted in his ECG report.
4. **Nutritional Deficiency:** Nutritional deficiency in any stage of development may be one important factor. Maternal deficiency of foliate, iron, Vitamin D, B12, Omega 3 may lead to improper development of brain. Vitamin D deficiency in pre or post pregnancy affects brain development of child. Whereas B12 and foliate influences DNA synthesis and neurotransmitter production, especially myelin sheath. DHA and EPA in omega 3 help in brain development and behave as anti-inflammatory agent, support mental help, shapes our behavior.
5. **Poor Maternal gut health:** Poor maternal gut health during pregnancy or post pregnancy may affect baby's brain health. Since our 10th cranial nerve Vagus is continuously communicating with our gut in two path way, poor gut micro biome may affect neuro transmitters and brain related activities.
6. **Birth Defects or complications:** Poor blood circulation in brain may lead to less O2 supply in brain. It may cause seizure or serious brain injury. Again new born may face difficulty during delivery or C-section and get brain hemmariage. Premature delivery or low birth weight may be counted as one serious factor.

7. **Environmental factor:** When a baby born in less talkative family and have less connection with parents and family members, situation gets worst. Sometimes innate nature of parents, unconditionally affects the baby. They may not be social and feel uneasy to mingle with other kids and it nurtures to groom the hidden feature of autism.
8. **Separation or sudden death in family:** Separation or sudden death in family may affect the child's development. Too much suppression of grave, make the person to be within them. Outside world may not leave a mark in their thinking and perception.

Symptoms of Autism: Everyone doesn't reflect the same symptom. Few symptoms are corner stone and equally manifested to an autism person; on the other hand, few symptoms are quite unique.

1. Poor Eye contact or no eye contact at all is considered as foremost symptom of Autism.
2. Children do not have standard words after 18 months of developmental stage, are in red zone.
3. Facial diagram of big eyes, symmetrical face and flared front teeth and smiley face. Few are little aggressive as well.
4. Repetitive behavior, flapping hand, moving from one place to another is common symptom.
5. Few have loss of appetite and few are fond of food.
6. They imitate the role model and follow them. Seven years old autism baby boy was giving response as music, what he was watching after his birth. He was so much into it; he felt this was the way of expression. Another 7 years old baby boy was fond of cartoons and when he visited my clinic, I observed, he was saying, " Oh, that's great ... When I checked with his mother, she said, they tell in cartoon like this.
7. They face difficulty for social interaction.

Precautions: There is no such kind of precaution to avoid autism. However, we can be cautious and alert about few things:

1. **Maternal health during pre and post pregnancy:** Maternal overall health should be checked during pregnancy and post pregnancy. Stress should be controlled and addressed. Proper Nutrition should be given to mother for proper development of fetus. Mother's gut health should be improved with proper diet and healthy habits.
2. **Mandatory prenatal checkup:** Mothers should do regular follow up and finish checkups during the 3-time star of pregnancy. The fifth month anomaly scan shouldn't be missed to avoid any kind of abnormalities in baby. It thoroughly evaluates the development of baby's bones, muscles, organs, any genetic defect and so on.
3. **Monitor every stage of development:** After birth the baby should be monitored every month. In the 1st month, what is the standard developmental milestone other babies of same age are reaching; it should be compared and checked. If the baby does the same, it means everything is going perfect and it indicates normal development. If any discrepancy is there, it should be addressed promptly. However, few may be little slow. Still, it should be monitored. For example, generally in 18th month most of the baby speaks words like mama, dada, sibling names and family members, ball, cup, toy name, go, eat, play, juice and many more. If the baby fails to do so, parents should wait

for 1 more month and address the issue. It has been observed that comparatively girls speak earlier than boys and boys start walking earlier than girls. However, reverse case is also observed.

4. **Baby shouldn't be left alone:** Baby should be accompanied all the time. Parents and other family member should communicate with baby. Baby should be allowed to play with other babies for better development and social interaction.
5. **Nutritional value monitoring:** Nutritional deficiency should be addressed especially vitamin D, B12, Omega 3, Folate Iron and so on. When we address vitamin and mineral deficiencies, it has so much positive effect on overall health, brain development and behavior. Green vegetables, proper hydration, O2 management, proper blood circulation, and variety of fruit should be encouraged to promote overall health and optimal development.

Treatment: There are different kinds of treatment available like-conventional, alternative, Unani, Siddha and so on. Speech therapy with any kind of treatment is more effective way to handle Autism. Sometimes when we catch the issue at early stage of development, it is possible to improve in most of the cases. Even in few cases, it has been observed that, it has corrected ignorance of eye contact also. However, it is possible, when we get the case as early as 2-3 years old. Parental and family support is mandatory to cope up with this situation. Since these kinds of children are more sensitive than anyone else, we must address the issue carefully. Screaming or rude behavior towards them can make the situation worst. We should handle the case more carefully, when ADHD and seizure episode is also involved. We cannot put too much pressure on speech therapy also, when Seizure episode is involved. For better prognosis, full body examination with Vitamin B12 and D, EEG, Cardiac risk marker, Total IgE, Homocystine, hsCRP, ESR, RA quantity, PpBS, ECG, Brain MRI is required for personalized individual treatment plan. It helps us to work on root cause of Autism to particular person. A full body assessment was performed with vitamin B12 and D, PpBS, total IgE, RA quantity for 7 years autistic boy, who was frequently catching cold. It was observed that he was Vitamin D deficient with serum level 0g18ng/ml, high allergy level with total IgE 3,160IU/mL, and exhibits grinding teeth at night, which is probably parasite infection. His SGOT was little elevated. He was presented with ADHD symptoms also. I have provided constitutional medicine based on full body exam and within one-month visible improvement was observed. I have provided Allen Vitamin D 600 Iu two times with Nutrilite Cal mag D plus K2 and Kid's chewable omega 3 along with SBL Magnesia Phosphorica 6x for magnesium. Other issues also addressed with homeopathy medicine and he was continuing speech therapy along with this treatment. Within one month, they could see difference in his behavior, concentration, and less mood swing.

Conclusions

We can summarize that autism is a spectrum of neurological disorders, which hinder brain development. Everything can go on a positive track,

if we knock it at little early stage. Moreover, pregnant mothers must take care of their health from 1st month to 9th month and even after post-delivery also. Each and Every stage of child development is crucial and so we must handle it with care. Awareness can make a big change and prepare us to handle such a sensitive situation.

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