The Factors, the Impact and Treatment for Autism Spectrum Disorders Among Children

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Abstract. The prevalence of Autism Spectrum Disorders (ASD) is about 1% around the world. Due to the paucity of available data, until now researchers failed to identify the cause of the disease, but have identified it was related to genetic or environmental factors. This paper summarized what people currently knew about ASD, including the factors which caused ASD, the impacts that ASD affected patients and their families, and the treatment for curing ASD. It was found that ASD could be affected by genetic and physical conditions of fetuses and parents in the natal period, and for the patients, the ASD symptoms possibly affected their health and social problems of them and their parents. Nowadays, the treatments usually were used just to reduce the symptoms and risk factors of ASD instead of curing completely, which included pharmacological and other pedagogical. These findings were significant in adding further in-depth understandings of ASD and further developing more fitting treatment methods for it.

Keywords: autism spectrum disorder, preterm birth, sleep disorder, pharmacological treatments.

1. Introduction

Autism spectrum disorders (ASDs) were a heterogeneous group of neurodevelopmental disorders like autism. It could strike before the age of 3, which meant before the age of 3, children could be tested for whether they had ASD or not. The significant characteristics were social and communication deficits with repetitive behaviors [1]. ASD children and their parents had to face a huge number of challenges. Children might suffer physical and psychological harm due to ASD, and might also be discriminated against and ostracized by people who did not understand autism. And their parents needed to spend more time taking care of their children and had to bear a huge financial burden for their children's treatment and education [2]. Parents and children were interrelated in terms of stress, even if the child had autism. This meant that when one partner took on a huge amount of stress, the other partner could feel it, while their stress increased. This was a vicious circle.

Although the symptoms of ASD would appear before age of three, the identifying methods in the past were outdated and could not be diagnosed in time. Nowadays, scientists found a useful method called Video-referenced Infant Rating System for Autism (VIRSA) to identify ASD. It was a system showing videos about kids playing with their parents, and the parents of the participants (Children who needed to be tested for ASD) chose which video showed the same playing mode as their own. Through this measure, it could be easy to determine whether the infant had ASD or not at 12 to 18 months of age [3].

The factors which caused ASD were complex, and it was difficult to detect what factors were directly responsible for autism. One of the reasons why it was hard to find was because of too few cases and not that much data analysis. The worldwide prevalence of ASD was only 1%, which also led to many people not understanding autism [4]. In general, autism was often caused by genetic, parental, or environmental factors, and all of them would be talked about later. However, some people still misunderstood what caused ASD. For example, some parents believed vaccinations for children could cause autism. This perception was not uncommon, and until now many parents were hesitant to vaccinate their children. Even though vaccines were not related to autism, these parents were convinced of it [5].

Therefore, this study summarized the factors, including genes and physical conditions of fetuses and parents in the natal period, the impacts, including health and social problems for children and their parents, and the treatment, including pharmacological and other pedagogical methods.

2. Factors

ASD could strike before the age of 3, which meant the children have had ASD as an embryo or infant. The factors which caused ASD were pretty complex and undetectable. In this article, three parts were showing the likelihood and factors of disease in infants at different times: The prenatal period, Perinatal period, and Neonatal period. It was important to note that because each patient was different and because people have not been able to identify the factors that could cause autism, the following factors could only indicate a chance of causing autism, not complete certainty. In other words, the absence of the following factors did not necessarily mean that a child was not likely to have autism, and vice versa. This also meant that research in this area needed to continue.

2.1 Prenatal risk

The main possible reason why infants with ASD was a genetic factor. It was pretty complex because it involved multiple genes. Many scientists tried to study the relationship between genes and ASD and would like to make sure which genes were the true reason causing ASD, however, there were some challenges during the study. One of them was that genetic testing was too expensive. That's why genetic testing was not been included in the ASD detection methods.

Recently, a study has proven that a variety of genetic mechanisms might cause ASD, and it has been shown that ASD could be inherited, especially in monozygotic twins. Until now, some kinds of genes have been revealed, such as NLGN3, NLGN4, and NRXN1 genes. And ASD could carry other complications with it, and the genetic factor was still an area that needed to be explored in the future [1].

Before birth, genes were not the only possible cause of fetal autism. The researchers analyzed some potential risk factors which might cause the appearance of ASD: parents' physical conditions, primiparous women, and mothers born outside Europe, North America, or Australia. And in these factors, one of the parents' physical conditions was more scientifically based. And the research illustrated that some conditions might cause infants' mental illness. The most possible condition which may cause ASD was one of the parents was too advanced (>40 years old). And for pregnant women, if they had bleeding, medical treatment, or diabetes, it was still possible but in these three conditions, only medical treatments have been proven [6].

2.2 Perinatal risk

The perinatal period was empirical and hard to be defined, and in this article, it was defined as the period of delivery. In this period, the childbirth condition may lead to ADS, such as preterm and post-term pregnancies. The research illustrated those premature babies were more likely to have ASD than babies born normally [6]. However, it did not mean that a premature or overdue birth necessarily meant that the child had autism

2.3 Neonatal risk

Some factors which were infants' physical condition would be detected when the infants were born, to determine risk factors for autism, such as their sizes and weights. Also, several newborn complications may contribute to the cause of ASD. One classic example was hyperbilirubinemia, which has been proven that hyperbilirubinemia caused the possibility of ASD to increase [6]. If these characteristics and conditions were outside the normal range, doctors would notice them, which meant that there was a theoretical chance that autism would be detected. In practice, however, identifying autism was complex and not just a few abnormal conditions could be determined

3. Impact

Children with a disability had to face a huge number of challenges recently, not only ones with ASD. As for ASD, most of the troubles came from the health effects of ASD itself and other people's prejudices about ASD. In this article, there were three directions illustrating the true situation of ASD children: personal health, how ASD affected their body health, families, including their parents' mental and financial pressure, and social functions, including the trouble the children may face in social lives, to let more people understand what ASD impacted and learned how to help them in need.

3.1 Personal Health

The main factors of ASD affecting children's health were mood disorders or emotional behaviors and sleep disorders. For challenging and emotional behavior, it included emotional instability, self-injurious behaviors, intellectual disability (ID), and as for self-injurious behaviors, which would be talked about later.

Some people believed emotional instability was one of the factors of ASD, and others thought it may be one of the side effects of drugs used to treat ASD. Then, some researchers examined ASD children's behavior and emotion by the Developmental Behavior Checklist (DBC), which could test ID children's behavioral and emotional symptoms. After research, they realized that emotional instability could be used to predict ASD symptoms, and not only the ASD but also some external reasons could aggravate mood disorders, like the pressure of parents. Although children could not communicate with their parents well, they still could feel the stress of parents. It also illustrated that parents' and children's mental health were linked in both directions [7]. It also meant that children's emotions were easily influenced by the outside world, even if they were not aware of it themselves. When their emotions were uncontrollable and they were unable to communicate well with others, they were likely to engage in dangerous actions and expressions, such as irritability and aggressive behavior.

Another factor that caused ASD children to face emotional behaviors was sleep disorders. Insomnia disorders, especially in childhood, caused children to have emotional problems, such as irritability. It includes two kinds of behaviors: externalizing behavior, like hyperactivity and aggression, and internalizing behavior, like social withdrawal, anxiety, and depression. And lack of sleep hours would aggravate the severity of ASD and two types of behaviors for patients [8]. Insomnia disorder was a complication of many mental illnesses, like Attention-deficit/hyperactivity disorder (ADHD). It meant that sleeping problems also affected other mental illnesses. And it showed that if the sleeping disorders have been treated, symptoms of other psychiatric disorders could also be relieved [8]. As for how to treat insomnia, it would be talked about later.

3.2 Families

It has been shown that the mental situation of parents could be contacted to that of ASD children. It meant that caregivers of children with autism spectrum disorder (CASD)'s stress and mental condition should also be paid attention to. The study pointed out that CASD had higher levels of stress, anxiety, and depression than regular parents. Due to their children's situation, they have had to pay more attention to them, and the treatment or education was also a major expense, which led to a heavy financial burden on the family. At the same time, as children felt pressure from their parents despite their inability to express themselves, their anxiety increased as their condition became worse. It became a vicious circle mentioned before. However, with the huge pressure, fewer people paid attention to them. And it meant the government or social group could give them help, whether it's financial or spiritual help, it could ease their burden [2].

3.3 Social Functions

First of all, the main impact of social functions which caused serious damage to ASD children was self-injurious behavior (SIB). The SIB usually came from children's maladaptive behaviors, which

were also aggressive and dangerous. These behaviors hurt themselves, at the same time, might attack their caregiver. Also, these behaviors were often repetitive, usually rubbing or bumping against the head. These behaviors may threaten their lives. Nowadays, some researchers observed some patients and realized that the level of SIB might also be related to e severity of ASD symptoms. They found that the more severe the ASD, the more the patient tended to attack themselves and their behavior. And they summarized seven factors that may affect SIB for ASD children: (a) abnormal sensory processing; (b) low cognitive ability; (c) could not or hard to communicate with others; (d) low social functioning; (e) age; (f) the need for sameness; (g) compulsions. And in these 7 factors, abnormal sensory processing was the main factor causing SIB. When children had a pretty low peripheral sensation, SIB could help them to perceive their own body, and this behavior would give them euphoria. Due to this characteristic, testing sensory processing was the main method to predict whether a child has ASD or not [9].

Another main impact on ASD children was school bullying. Around 30% of students in the school participate in bullying, including bullies and victims. And children with ASD were at higher risk of bullying because most of them had to face many social challenges: lack of communication ability, fewer friends, and harder to integrate into the group than"normal" children. If they studied in a normal educational school instead of a special education school, they were more possible to face bullying. And there was another point that should be mentioned: parts of children who have been bullied in school would not tell their parents about their dangerous situation, because they might face more serious bullying after suing or they could not communicate with their parents. It meant that the caregivers should communicate well with their teachers and school workers to understand children's situation in school. And to decrease the possibility of bullying, in other words, to welcome more ASD children to go to normal schools, the government and schools should adapt and improve the system for students with ASD and require teachers to be trained related to ASD. Schools also needed to promote anti-bullying education to protect victim students from bullying, not only ASD children [10].

4. Treatments

Nowadays, despite our growing understanding of autism, we still have not found a complete cure for ASD in terms of treatment, and all current methods could only achieve remission, and the younger the patient was, the better the treatment would affect. The methods discussed in the article were the more effective ones. It has been divided these ways into two parts: pharmacological treatments, which were the main uses of medication to alleviate the various symptoms of ASD, and pedagogical and psychotherapeutic therapies, which used mainly communication and education to help patients manage their emotions, in order to demonstrate the treatment of ASD in two directions.

4.1 Pharmacological Treatments

4.1.1. Pediatric Prolonged-Release Melatonin(PedPRM)

Although autism cannot be eradicated, psychiatrists nowadays have had many ways to reduce its effects. Sleep disorders were one of the major impacts of ASD which has been mentioned above. Nowadays, Pediatric Prolonged-Release Melatonin(PedPRM) has been proven that it could be used to treat sleep disorders. The researchers experimented, including the PedPRM treatment group and placebo treatment group(control group), to determine whether PedPRM treated insomnia disorders well or not. And based on the data in the research, it illustrated that compared with the treating group by placebo, the period of sleep time had increased significantly [8]. It meant that PedPRM could treat sleeping disorders to reduce ASD symptoms. It was also found that daytime challenging behavior could decrease at the same time the emotion would be also more stable. It illustrated that the patients could be more able to control their behaviors and emotions than those without PedPRM [7]. And it has been proven that PedPRM could be effective in relieving not only autism but other psychological conditions as well since poor sleep quality could lead to many mental illnesses.

4.1.2. Atypical antipsychotics

The atypical antipsychotic was a typical method to treat irritability and associated behaviors. It has been mentioned before that one impact of ASD was irritability and self-injury behavior, which meant atypical antipsychotics could be chosen to cue ASD. It was also one of the common pharmacological methods currently used to treat autism. And after trials and tests, the patients showed significant improvements in their condition and their moods became relatively stable and manageable after taking the medication. Many diseases with symptoms of irritability and aggressiveness could also be treated with it. However, after investigation and research, this type of drug still had side effects, and some children have experienced adverse physical reactions after taking it, especially weight gain and movement disorders. Therefore, in future studies, the possibility and influence of side effects should decrease [11].

4.1.3. folinic acid treatment

As mentioned earlier, the condition of pregnancy may also lead to an infant with autism, and its factors included folate deficiency and folate receptor autoimmune disorder. They were major causes of pregnancy-related complications and fetal developmental abnormalities. These might affect the infants' brain structure, function, and development. It may be one of the causes of ASD. And in that case, folinic acid treatment could improve some of the core ASD deficits. In the study, the language expression and social interaction of some ASD children have been improved after drinking oral folinic acid. The folinic acid treatment could be used also to treat the harmful effects of folic acid deficiency and to prevent the pathological consequences of folic acid receptor autoimmune diseases [12].

4.2 Pedagogical And Psychotherapeutic Therapies

Although no medication was a direct treatment, doctors generally chose both medication and educational psychological methods to control and improve behavior. In some research, it was found that doing some basic exercises could improve cognition and behavior in autism, which was why many doctors were encouraging autistic patients to exercise more. Exercise could also modify the inflammatory status and thus improved the associated metabolic disorders, which was one of the factors that ASD may cause. However, molecular and cellular mechanisms induced by exercise intervention needed to be explored and studied in the future[4]. In fact, as for the treatments of some mental illnesses, many psychiatrists encouraged their parents to do more regular exercise. Not only that, but exercise could also relieve emotional depression. That's why exercise was one of the methods to release stress.

5. Conclusion

In this study, it was reviewed the main factors causing ASD that the researchers figured out so far. They were mainly about genes, heredity, parental condition, and environmental factors. However, these factors only indicated a probability of ASD, which meant they were complex and full of uncertainty and there was still a lot of research to be studied in this area. The impact on ASD children, in addition to the pain caused by autism itself, such as insomnia troubles, pressure, and other people's lack of understanding of ASD could also take a toll on them and their parents. Because there was little research related to treatments found, the mechanisms involved could be explored in the future. As for the treatment, although the earlier autism was detected, the better the treatment would be, until now all treatments could only improve their situation, not cured it completely.

However, previous studies had not found efficient ways to prevent ASD. In future studies, researchers could further investigate the possible factors of ASD, and further filled the population gap of intervention to understand the disorder well.

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