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Fetal Alcohol Spectrum Disorders

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Abstract: ***The term "foetal alcohol spectrum disorder" (FASD) describes the variety of issues brought on by prenatal alcohol consumption (exposure to alcohol during pregnancy). Foetal alcohol spectrum disorders (FASD) include foetal alcohol syndrome (FAS), Partial FAS. Alcohol-related neuro-developmental disorder (ARND) and Alcohol-related birth defects (ARBD). Each of these disorders involves brain damage that leads to cognitive and behavioural problems, but FAS is the most well-known of the bunch due to the iconic craniofacial dysmorphologies and growth limitation brought on by early alcohol exposure in foetal life. This article discusses the causes, signs and symptoms, diagnosis, protective factors and management of foetal alcohol spectrum disorders.***

Keywords: Fetal alcohol spectrum disorder, Fetal alcohol syndrome, Structural brain development, The biomarker, Early diagnosis, Protective factors

1. Introduction

An individual who has had prenatal alcohol exposure may experience a wide range of impacts, which are collectively referred to as **"Foetal alcohol spectrum disorders" FASDs.** Physical, emotional, behavioural and /or learning problems can be permanent consequences of these events.

Causes

Alcohol consumption during pregnancy leads to foetal alcohol spectrum disorders. It is not inherited. Cell growth is harmed by alcohol. Alcohol consumption by the birthing parent during pregnancy affects the growing foetus. The developing foetus's body and brain may suffer as a result.

The effect of alcohol on a foetus in development relies on:

- how often the pregnant parent drinks
- how much alcohol a pregnant person drink
- when the expectant parent drinks during pregnancy

Other factors can affect foetus development, such as:

- stress
- the birthing parent's age
- smoking or other drug use
- the birthing parent's nutrition

Types

FAS - This diagnosis needs a characteristic pattern of facial abnormalities; growth deficits, prenatally and/or after birth; and central nervous system abnormalities.

Partial FAS - Some of the symptoms and indicators of full FAS, but not all three of the previously mentioned traits bullet.

Alcohol-related birth defects (ARBD): This category consists of only aberrant bodily changes brought on by alcohol.

Neurodevelopmental disorder (ARND) associated with alcohol use. Anomalies of the central nervous system are also included along with behavioural and cognitive issues in this type.

Signs and Symptoms

Children who are born with FASD may experience a variety of issues, including physical, behavioural, academic, and social issues. Depending on the type of FASD they have, they may have different challenges.

- Unusual facial characteristics such as a ridge between the nose and top lip that is smooth
- Small head
- Less height than normal
- Slim body size
- Faulty coordination
- Activated state of mind
- Difficulties with memory and concentration
- Difficulties in school
- Delays in Language and speech
- Low IQ or intellectual impairment
- Faulty Judgement and reasoning
- Challenges with sleep and sucking as a baby Vision or hearing issues
- Cardiovascular, renal or skeletal issues

Diagnosis

Researchers are currently concentrating on more precisely defining three areas to create better approaches to identify kids with FASD:

- Distinctive facial dysmorphology and variations in the brain are structural abnormalities that characterise children with FASD
- Functional abnormalities
- The biomarker

Facial Dysmorphology

Face dysmorphology, or specific abnormalities in facial characteristics, can result from prenatal alcohol exposure. For the purpose of diagnosing kids with the full FAS, it is essential to recognise this particular pattern of facial traits. These characteristics must be recognised in order to diagnose FAS, but not everyone has access to a specialist who can do so. The effects of foetal alcohol exposure also extend to many kids who lack these recognisable facial characteristics. Because of this, many affected children are missed when FASD is identified largely based on visual traits.

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To detect face dysmorphology, researchers are now creating computer systems and three-dimensional cameras.

With the help of this technology, diagnosis could be automated, fewer professional consultations would be necessary, and more people could be screened for FASD.

In order to compare the facial differences between children who were exposed to alcohol during pregnancy and those who were not, researchers from the Collaborative Initiative on Fetal Alcohol Spectrum Disorders (CIFASD) are using a three-dimensional camera system. Telemedicine can now identify children with FAS thanks to the usage of such cameras. Furthermore, the computer technology ought to make it possible for researchers to decipher more nuanced face characteristics seen in people with FASD. The use of these computer-generated algorithms could potentially aid in the discovery of new facial characteristics that would help to more fully characterise FASD.

Age also has an impact on our capacity to recognise differences.9 Thus, using the three-dimensional camera approach on kids of various ages may result in FASD being discovered earlier.

Structural Brain Development

Researchers are now better able to comprehend this impact on the structure and, consequently, the functioning of the brain thanks to advancements in imaging techniques.

Magnetic resonance imaging (MRI) and functional MRI are the two imaging methods that scientists frequently employ (fMRI). When compared to individuals who were not exposed to alcohol during pregnancy, MRI examinations of people who were exposed to alcohol during pregnancy reveal variations in the size and volume of the brain as well as in the tissues inside the *brain*.

fMRI, which uses a strong magnetic field to depict how blood flows in the brain. Generally speaking, a brain structure that is stimulated receives increased blood flow. Researchers may monitor this blood flow to learn how different areas of the brain function and which parts of the brain react to certain stimuli.

The activity patterns in several brain regions of people with FASD differed from those of people who had not been exposed to alcohol, according to studies using functional magnetic resonance imaging (fMRI). Both children and adults with FASD have similar brain activation patterns, demonstrating that the FASD-related brain abnormalities do not necessarily get better with age.

The Biomarker

The following screening methods are being looked into by researchers as potential biomarkers for prenatal alcohol exposure:

- PEth, or phosphatidylethanol, is a byproduct of alcohol metabolism that could be a sign of heavy maternal drinking. It manifests in the blood of a newborn.
- Screening for fatty acid ethyl ester (FAEE) —FAEEs, which metabolites of alcohol metabolism, which can be found in those who are exposed to alcohol during pregnancy develop the fetus's hair and stool, and it can be measured in the newborn's meconium or hair.
- MicroRNA screening-As a result of alcohol consumption during pregnancy, specific types of microRNA, or non-protein-coding RNAs, may change.

Protein (or proteomic) screening: This technique searches for potential protein patterns that could change in the presence of alcohol.

In order to identify children at risk for FASD early, researchers are focusing on ways to make it easier to detect these biomarkers.

Early Intervention Services

FASDs cannot be cured, however research indicates that early intervention services can help a kid develop. Early intervention services support children's learning of critical skills from birth to 3 years. Services include therapy to support the child's development of speech, mobility, and social skills. Additionally, there is frequently no need to wait for a formal diagnosis before beginning therapies like speech therapy for language difficulties or physical therapy for mobility impairments.

Protective Factors

- **Early detection**

A young child who receives a diagnosis can be enrolled in the proper classes and receive the social services required to support the child and his or her family. Early diagnosis also aids families and school staff in comprehending why the youngster may occasionally behave or react differently from other kids.

- **Involvement in social services and special education**

Children who receive special education tailored to their individual needs and learning preferences are more likely to realize their full potential. A variety of learning needs and behavioural issues may need to be addressed in children with FASDs. Programs for special education can better serve the needs of each kid. Families of children with FASDs who receive social supports, such as such as counselling or respite care, have more favourable experiences.

- **Loving, Nurturing and stable home environment**

FASD-affected youngsters may be more sensitive than normal kids to interruptions, changes in way of life or routines, and unhealthy relationships. A child with FASD must, therefore, place a high value on having a loving, secure home life. Additionally, secondary problems like criminal activity, unemployment, and incomplete education can be avoided with the cooperation of the community and families.

- **Absence of violence**

Children who have been exposed to violence as children are far more prone to develop secondary conditions than people with FASDs who live in stable, non-abusive households or who do not get involved in juvenile violence. Teaching alternative strategies for children with FASDs to express their rage or frustration is necessary.

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Types of Treatments

Treatment options for those with FASDs are numerous. Generally speaking, they fall into five categories:

1) Health Care
2) Medication
3) Behaviour Therapy and Education
4) Parent Education
5) Alternative Methods

Health Care

The health and medical needs of people with FASDs are the same as those of people without FASDs. They require basic medical care, well-baby care, immunizations, a healthy diet, exercise, and decent hygiene just like everyone else. The use of any drugs to treat FASDs has not been authorised. Nevertheless, a number of drugs can help with FASD symptoms. As an illustration, medication may be used to treat depression, focus issues, or high levels of energy.

Medication

Here are some examples of drugs that are used to treat the signs and symptoms of FASD:

- **Stimulants**
  Hyperactivity, difficulty focusing, poor impulse control, and other behavioural disorders are among the symptoms that are treated with this kind of drug.
- **Antidepressants**
  This kind of medicine is used to treat symptoms like depressed mood, loss of interest, sleep issues, interruption of schoolwork, negativity, impatience, aggression, and antisocial behaviours.
- **Neuroleptics**
  Aggression, anxiety, and a few other behavioural issues are treated with the help of this particular kind of drug.
- **Anti-anxiety medications**
  The symptoms of anxiety are treated with this kind of medication

Behaviour Therapy and Education

For kids with FASDs, behavioural and educational therapies can play a significant role in their care.

The following behavioural and educational therapy have been demonstrated to be successful for some kids with FASDs:

- Good Buddies – A children's friendship training to teach individuals with an FASD appropriate social skills
- Families Moving Forward (FMF) program to provide support for families who deal with challenging FASD behaviors
- Math Interactive Learning Experience (MILE) program to help with mathematics difficulty
- Parents and Children Together (PACT) a neurocognitive rehabilitation program to improve self-regulation and executive function

Parent Training

The typical parenting techniques might not work on children with FASDs. Parent training has been effective in educating parents about their kid's impairment, as well as about how to educate their child a variety of skills and support them while they manage their FASD-related symptoms. Group or one-on-one family training sessions for parents are both options. Therapy professionals or specialised classes provide these programmes. A family therapist or counsellor may be needed by families. Local support groups where parents of children with FASDs can discuss issues, ask questions, and find encouragement may also be helpful to parents.

Alternative therapies for those with FASDS include the following:

- Biofeedback
- Auditory training
- Relaxation therapy, visual imagery, and meditation (especially for sleep problems and anxiety)
- Creative art therapy
- Yoga and exercise
- Acupuncture and acupressure
- Massage, Reiki, and energy healing
- Vitamins, herbal supplements, and homeopathy
- Animal-assisted therapy

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