

Fetal alcohol spectrum disorders (FASD) and slow wave sleep

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Abstract

Fetal alcohol spectrum disorders (FASD) are the clinical group of conditions that can occur in a person whose mother drank alcohol during pregnancy period. The problems may include an abnormal appearance, short height, low body weight, small head, poor coordination, low intelligence, especially behavior problems, and problems with hearing or seeing. Those affected more commonly have trouble in school going age , are involved in hyper sexual activity, and have trouble with alcohol or other drugs. Slow-wave sleep means the deeper sleep during which the brain turns each day's events into permanent memories - is fragmented in adulthood in people exposed to high levels of alcohol in the womb. There is no any specific treatment plan for FASD. Because CNS damage, symptoms, secondary disabilities, and needs vary widely by individual to individual, there is no one treatment type that works for everyone. Psychoactive drugs are frequently tried on those with FASD as many FASD symptoms are mistaken for or overlap with other disorders, most notably ADHD.

Keyword : *Fetal alcohol spectrum disorders , alcohol*

Introduction

Fetal alcohol spectrum disorders (FASD) are the clinical group of conditions that can occur in a person whose mother drank alcohol during pregnancy period.[1] The problems may include an abnormal appearance, short height, low body weight, small head, poor coordination, low intelligence, especially behavior problems, and problems with hearing or seeing.[2] Those affected more commonly have trouble in school going age , are involved in hyper sexual activity, and have trouble with alcohol or other drugs.[3] The most severe form of the group of conditions is known as **fetal alcohol spectrum disorders (FASD)**.[4]

Slow wave sleep and FASD:

Slow-wave sleep means the deeper sleep during which the brain turns each day's events into permanent memories - is fragmented in adulthood in people exposed to high levels of alcohol in the womb. This is according to a study conducted by researchers at NYU Langone Medical

Center and its Nathan S. Kline Institute for Psychiatric Research (NKI), and recently published online in the journal Neuroscience. When combined with the findings of past studies in humans, the current study in mice suggests a new treatment approach for individuals suffering from fetal alcohol spectrum disorder, which is linked to learning, memory and mood problems, and is estimated to affect 1 in 100 adults.[1]

According to the authors of the new study, exposure of a developing brain to binge levels of alcohol results in a permanent fragmentation in slow-wave sleep, with the extent of the fragmentation influencing the severity of related cognitive disorders."We have known for a long time that sleep fragmentation is associated with impaired cognitive function, attention and emotional regulation," says Donald Wilson, a professor in NYU Langone's Departments of Child and Adolescent Psychiatry and Neuroscience and Physiology, and a member of the NKI. "Our study shows for the first time that binge alcohol exposure early in life results in long-lasting slow-wave sleep fragmentation, which, in turn, is associated with learning problems."It appears that some of the consequences of fetal alcohol syndrome stem from changes in the brain's ability to regulate sleep,"[1]

Using a mouse model of fetal alcohol syndrome designed to estimate the third-trimester of pregnancy in humans,

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researchers examined slow-wave sleep in adult mice that were injected once with the equivalent of binge amounts of ethanol (drinking alcohol) seven days after they were born. Mice in a control group were injected with saline. Mouse brains continue to develop after birth, and seven days post birth in mice equates with third trimester brain development in a human fetus.[1]

Mice exposed to ethanol were found to spend less time in slow-wave sleep and experience severe sleep fragmentation, both with a significant link to memory impairment. The research team also found that the ethanol-exposed mice were hyperactive, but the mice from the control group were not. The ethanol-exposed mice also displayed reduced and fragmented slow-wave sleep and increased sleep/wake transitions over 24 hour periods.[1]

In addition, impaired contextual fear conditioning memory characterized by impairment in memory of events that occurred in specific contexts was seen in the ethanol-exposed mice, but not in the control group. The severity of this memory impairment was directly correlated with the extent of sleep fragmentation.” Targeting therapeutic interventions mainly toward sleep may help to relieve aspects of the diverse disorders linked to fetal alcohol exposure, and may open new avenues for treatment of this far too common condition”

Management of FASD:

There is no any specific treatment plan for FASD. Because CNS damage, symptoms, secondary disabilities, and needs vary widely by individual to individual, there is no one treatment type that works for everyone. Psychoactive drugs are frequently tried on those with FASD as many FASD symptoms are mistaken for or overlap with other disorders, most notably ADHD.[5]

Second line treatment includes Behavioral interventions are based on the learning theory, which is the basis for many parenting and professional strategies and interventions. Along with ordinary parenting styles, such strategies are frequently used by default for treating those with FAS, as the diagnoses oppositional defiance disorder (ODD), conduct disorder, reactive attachment

disorder (RAD) often overlap with FAS (along with ADHD), and these are sometimes thought to benefit from behavioral interventions. Frequently, a person’s poor academic achievement results in special education services, which also utilizes principles of learning theory, behavior modification, and outcome-based education.[6]

Many books and handouts on FAS recommend a developmental approach, based on developmental psychology, even though most do not specify it as such and provide little theoretical background. Optimal human development generally occurs in identifiable stages (e.g., Jean Piaget’s theory of cognitive development, Erik Erikson’s stages of psychosocial development, John Bowlby’s attachment framework, and other developmental stage theories). FAS interferes with normal development, which may cause stages to be delayed, skipped, or immaturely developed.[6]

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