CHILD & ADOLESCENT DIVISION

The 9th Congress of The Asian Society for Child and Adolescent Psychiatry and Allied Professions (ASCAPAP) and 3rd National Congress of the Indonesian Association of Child and Adolescent Mental Health (IACAMH)

Cultural Diversity, Challenging Life Events and Stigma :

IMPROVING CHILD AND ADOLESCENT QUALITY OF LIFE

Yogyakarta, 24 - 26 August 2017

Proceeding Book

Editor:
Tjhin Wiguna, Fransiska Kaligis,
Leslie Melisa

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"Culture Diversity, Challenging Life Events and Stigma: Improving Child and Adolescent Quality of Life"

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Indonesian Psychiatric Association
In Collaboration with
Indonesian Association of Child and Adolescent Mental Health

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Welcome to ASCAPAP 2017

Selamat Datang

ASCAPAP 2017 is designed to bring together all practitioners of child and adolescent mental health in Asia, which includes the child psychiatrist, psychiatrist, representatives from the allied professions of pediatrics, psychology, nursing, public health, education, social work and other relevant fields dedicated to improving child mental health global, regional and locally.

The theme of congress is " Cultural Diversity, Challenging Live Events, and Stigma: Improving Child and Adolescent Quality of Live".

ASCAPAP 2017 will allow us to meet each other, learn from a comprehensive scientific program, promote and advocate for our research and ideas.

When you come to Indonesia you will enjoy a wide variety of local culture and beautiful natural scenery from the Indonesian's Archipelago.

The 9th Congress of The Asian Society for Child and Adolescent Psychiatry and Allied Professions (ASCAPAP) will be a joint meeting with the 3rd National Congress of the Indonesian Association of Child and Adolescent Mental Health (IACAMH)

"It is easier to build strong children than to repair broken men." (Frederick Douglass)
"If you want to go fast, go alone, if you want to go far, go together " (African proverb)

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SP.16.2.
Interaction of Gene-Environment in Attention Deficit/Hyperactivity Disorder (ADHD): The Importance from Developmental Perspectives

Yunias Setiawati
Indonesia

Introduction

Attention deficit hyperactivity disorder (ADHD) is known as a neurodevelopmental disorder under genetic influences characterized by impairing attention, motor hyperactivity and impulsivity. ADHD often continues into adulthood and co-exists with other psychiatric and medical conditions. Although ADHD is characterized by the symptoms of attention deficit, hyperactivity, and impulsivity, it was reported that it might have an impact of environmental influences on the developmental course of the symptoms.

Genetic, neurochemical, and brain imaging methods are largely responsible for the stability of ADHD but also the environmental risk factors. Similar to many psychiatric disorders, a number of genes emerge with each other and the environment result in the developmental stage of the disorder. Determining the environmental factors that play a systematic decline or increase of the disorder is important to provide more comprehensive interventions starting from early developmental periods, and to take required precautions in those patients. Various environmental factors probably increase the incidence of childhood ADHD. In this paper, we mentioned the environmental risk factors that were most commonly associated with ADHD etiology.

Pregnancy, labor/delivery, and the neonatal complications are the most common environmental risk factors have often been associated with ADHD pathophysiology. It has been proposed that the risk factors that affect brain development negatively in critical periods would have long-term effects on cognitive functions and behaviors. ADHD has been associated with maternal smoking and alcohol consumption, emotional stress and medical diseases during pregnancy, pregnancy as well as labor complications, low birth weight, prematurity or postmaturity, early childhood physical trauma that could affect brain development negatively, and psychosocial challenges.

The complications that were associated with ADHD include maternal health problems during pregnancy, toxemia or eclampsia, maternal age, intrauterine infections, fetal postmaturity or prematurity, difficult traumatic labor, fetal stress, low birth weight, prenatal bleeding, and all postnatal complications that may affect brain development. Prenatal complications refer to the mother or fetus experiencing complications during the month of gestation, while perinatal complications are referred to those that occur during birth. Pre- and perinatal risk factors may cause hypoxic injury and neuronal developmental defects at the early developmental periods of the brain. ADHD are usually linked to basal ganglions, one of the most metabolically active structures of the brain, and they are sensitive to hypoxic injury. Any perinatal injury to the frontal lobe has been reported to probably affect cognitive functions such as attention, motivation, and planning, and cause ADHD symptoms. Some other studies reported that a strong correlation between low birth weight and ADHD suggested that children with low birth weight were more often inattentive, had social problems, and low self-esteem.

There are certain genes linking to the disorder, particularly the dopamine D4 receptor (DRD4) and dopamine D5 (DRD5) receptor genes that implicated in hyperactivity. The focus on the dopamine system comes from the well-characterized response of hyperactivity to stimulants such as

methylphenidate. Dopamine system might be underactive in children with ADHD. As with other risk factors associated with ADHD, an individual's genetic is neither sufficient nor necessary to cause it, but might as well increase the risk. Gene-environment interactions, which are as yet unclear, are also likely to be of importance when understanding the role of genes in ADHD.

Prenatal maternal smoking is a risk factor for hyperactivity in the offspring. Smoking disturbs normal placental functions by decreasing uterine blood flow. Decreased oxygen supply and nourishment of fetus results in hypoxia-ischemia and malnutrition. As a result, intrauterine growth retardation occurs. It is also affected pre- and postnatal growth negatively, damaged neuronal pathways, caused abnormalities in cellular proliferation and differentiation, inhibited development systems, and hence increased the risk for cognitive developmental defects and behavior problems in children and adolescents. Maternal smoking increased the risk of ADHD. Interestingly, non-smoking mother's exposure to environmental tobacco smoke or paternal smoking during pregnancy, was also associated with increased risk of ADHD.

Maternal alcohol consumption is one of the risk factors for the development of ADHD. Prenatal exposure to alcohol has long been known to cause brain abnormalities. Prenatal alcohol exposure increases the risks for hyperactivity, destructive-offense oriented or impulsive behavior, and psychiatric disorders in children. Cognitive deficits include overall intellectual performance, learning and memory, language, inability to concentrate, reaction time, visual- spatial abilities, executive functions, fine and gross motor skills, and adaptive and social behaviors.

Environmental toxins and fetal development is the impact of different toxins from different environment on the development of the fetus. The embryo is relatively susceptible to impact from adverse conditions within the mother's environment. Exposure to toxins such as lead, mercury, and manganese, or food additives such as dyes and preservatives, as well as sugars was reported to result in the development of ADHD.

A study suggests that iron deficiency may contribute to ADHD. Iron is a cofactor of tyrosine hydroxylase enzyme that plays a role in the rate limiting step of dopamine synthesis. Another study found a correlation between low ferritin levels and hyperactivity scores in children with ADHD, however no relation was found with cognitive functions. Ferritin allows the body to store iron and is used as a measure of iron levels. The children with the most severe iron deficiencies were also the most inattentive, impulsive and hyperactive. However, the reason for the low iron levels in children with ADHD remains unclear because the children in the study did not have evidence of malnutrition, which might contribute to low iron levels.

Psychosocial challenges were correlated with ADHD development. Familial factors associated with childhood mental disorders including severe marital discord, social status, parents' criminality, parents' mental disorders, lack of family consolidation were described as adversity factor. It's not surprising that someone living with ADHD might also experience excessive levels of stress. ADHD presents going challenges that can lead to frustration and feelings of loss control and hopelessness. Some stressors can be removed or avoided altogether with strategies for dealing stressful situations.

Oxidative stress is an imbalance between the systemic manifestation of reactive oxygen species and a biological system's ability to detoxify the reactive intermediates or to repair resulting damage. Overproduction of free radicals can be implicated in the pathogenesis of a variety of diseases, and, the brain has bigger vulnerability to oxidative damage, able to cause pathogenic mechanism underlying many psychiatric disorders.

ADHD individuals have significantly lower levels of zinc and copper which are essential in human nutrition and health. Deficiency of zinc is associated with the pathophysiology of disease. On the other hand, high copper is associated with low CU/ZN SOD levels in ADHD individuals. ADHD individuals have lower dopamine activity in caudate and limbic system, also dopamine receptor levels in the midbrain.

Conclusions

ADHD heritability highlights the considerable role that environmental factors may play in disorder susceptibility. The most important challenges in studies investigating the association between ADHD and environmental risk factors are substantial. All studies performed to indicate the significance of environmental risk factors in the development of ADHD. However, while some of these environmental risk factors are well established, others still require more investigation making it difficult to draw firm conclusions.

Exposure measurement is frequently problematic as well because studies often depend on single exposure measurement, which may not reflect cumulative lifetime exposures or exposure at the most critical period of development. Given these limitations, further investigation of the relationship between environment risk factors and ADHD is critical for possible prevention of those diseases, as well as for the execution of comprehensive interventions starting from early developmental stages, and for taking necessary precautions.

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