



## ADHD in Patients with Congenital Heart Disease

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### ABOUT THE STUDY

Neurodevelopmental disorders, especially executive function disorders, are currently the most common long-term prevalence in the CHD population. The purpose of this study was to investigate the frequency of attention deficit hyperactivity disorder (ADHD) in children with CHD. Congenital heart disease (CHD) is the most common birth defect in the world, affecting millions of newborns each year. From 1970 to 2017, the global average prevalence of CHD was 8.22 per 1000. To improve CHD management, most patients can survive infancy or beyond. Currently, there are challenges related to the quality of life and long-term evolution of these patients.

The most common long-term morbidity in the CHD group is neurodevelopmental abnormalities, particularly executive function impairments. Executive function refers to a set of higher neural cognitive abilities that help coordinate and organize behavior toward goals, allowing individuals to adapt to new or complex situations. Executive function disorders manifest as behavioral deregulation and attention issues, working memory impairment, and organizational and planning skill issues. Executive function is more strongly associated with school readiness than IQ, predicting both math and reading literacy throughout school education, and strongly associated with social cognition.

According to a study children with CHD had a higher risk of developmental and intellectual retardation, a higher incidence of gross and subtle motor abnormalities, and an average IQ score compared to age-matched controls. CHD has shown an

increased risk of developmental disability and developmental delay. In fact, the presence of risk factors has resulted in a modest increase in the risk of ADHD or autism. However, the hazard ratio for ADHD increased exponentially by 16.59 times.

CHD can cause newborns to experience perinatal adverse events such as perinatal infection, preterm birth, and low birth weight. The potential role of these perinatal comorbidities that can adversely affect the development of ADHD is still under debate. However, current studies do not show a correlation between coexisting perinatal disorders and ADHD. The increased incidence of ADHD in the CHD patient population may be due to the higher prevalence of genetic syndrome in children undergoing heart surgery than in the general population. Therefore, the risk of ADHD is unfortunately always higher than the average person. However, an additional consideration is the potential impact of disruption of cerebral blood flow during neonatal aortic arch surgery and subsequent loss of dopamine receptor activity.

ADHD has been the focus of attention in recent years and is common in congenital heart disease. Cardiopulmonary signs and symptoms, abnormal ECG findings, and other related neuropsychiatric disorders were fairly common in these children. This study showed that children born with CHD were at increased risk of developing ADHD. Further studies with larger sample sizes and more formal ADHD assessments may help assess the prevalence and risk factors of children with CHD. An interdisciplinary approach consisting of a pediatric cardiologist, a pediatric psychiatrist, and other related disciplines.

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