

Assessment of cardiac functions, aortic stiffness and heart rate variability parameters in children with Attention Deficit Hyperactivity Disorder

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Introduction: Attention deficit hyperactivity disorder (ADHD) is characterized by decreased attention span, impulsiveness, and hyperactivity. Cardiovascular involvement can be seen secondary to autonomic dysfunction. This study is conducted in order to assess possible cardiac involvement in children with ADHD and whether we investigate differences in ADHD subtypes or not.

Methods: In this cross-sectional study, we evaluated 73 children with ADHD (14 with hyperactivity, 25 with inattentive, and 35 with combined type), and 37 healthy children as controls. Cardiac evaluation was made using an electrocardiogram, conventional and tissue Doppler echocardiography and ambulatory holter monitoring.

Results: Systolic blood pressure and mean heart rate increased in ADHD patients ($p<0.05$). QT and QTc dispersion, which show ventricular repolarization homogeneity were similar in the groups ($p>0.05$). Left ventricle Sdm, Edm/Adm and interventricular septum Edivs/Adivs decreased by the measurements made by tissue Doppler echocardiography in ADHD patients ($p<0.05$). Aortic stiffness parameters were found similar in the two groups ($p>0.05$). SDNN, rMSSD and pNN50 decreased in the children with ADHD ($p<0.01$). As compared within ADHD subtypes; heart rate was higher, pNN50 and RMSSD were lower in combined subtype than the other subtypes ($p<0.01$).

Conclusions: Our findings showed cardiac involvement can exist in ADHD patients as secondary to autonomic dysfunction. This involvement was higher in combined subtype. Children with ADHD were at risk for cardiovascular complication. Before treatment, assessing all children with ADHD, especially combined subtype using with ambulatory Holter monitoring and tissue Doppler echocardiography in addition to detailed physical examination and electrocardiography might be helpful to detect cardiac complication in preclinical stage of the cardiac involvement.