

Evaluation of cardiac functions in children with liver cirrhosis using Brain natriuretic peptide and tissue Doppler imaging

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Introduction: Patients with liver cirrhosis suffer various degrees of cardiac dysfunction. Brain type natriuretic peptide (BNP) is a cardiac neurohormone released in response to increased ventricular wall tension. Cardiac dysfunction in cirrhotic children has been rarely investigated. The aim of the study was to evaluate the level of BNP and its relationship with cardiac functions in children with cirrhosis.

Patients and Methods: Prospective longitudinal study of 52 patients with hepatic cirrhosis and 53 age and sex matched healthy children as controls. Patients' ages ranged from 9 months up to 15 years. Cardiac function was assessed using BNP, conventional echocardiography and Tissue Doppler Imaging (TDI) for systolic and diastolic functions. Results were analyzed by using the Guidelines of American Society of Echocardiography. BNP plasma level was measured using quantitative ELISA technique for BNP supplied by WKEA MED SUPPLIES CORP.

Results: The BNP levels were significantly higher in cases compared to controls (5.25ng/l versus 4 ng/l, $p < 0.04$) but without significant difference compensated & decompensated patients. Compared with controls, the patients had larger left atrium and right ventricle diameters (P value 0.01, 0.02 respectively) and increased posterior wall thickness (P value 0.04). The patients had higher late atrial diastolic filling velocity (A wave) of tricuspid valve (TV) inflow (P value 0.001) and lower ratios between the early diastolic filling velocity (E wave) and E/A ratio of both mitral & tricuspid valves inflow (P value of 0.005 & 0.0008 respectively) The patients had significantly longer Isovolumetric Ventricular Relaxation Time (IVRT) of the left ventricle (P value 0.008) and higher early diastolic peak myocardial velocity (E') of the right ventricle (P value of 0.0003). The findings are compatible with diastolic dysfunction. The high level of the BNP was only correlated with the E wave velocity of the TV inflow (P value 0.004). BNP level showed no significant correlation with any of the clinical or laboratory findings. Conclusion: Cirrhotic patients have subtle cardiac dysfunction. BNP is a useful marker of cardiac dysfunction yet it could not be correlated with specific clinical or laboratory findings and still further studies are required to correlate it with echocardiographic findings.