Assessment of Left Ventricular Function in Children With Type 1 Diabetes Mellitus Using 2- D Strain Imaging

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ABSTRACT

OBJECTIVE: Type 1 diabetes mellitus (T1DM) is one of the most common chronic disorders of childhood and adolescence with increasing incidence worldwide. Cardiovascular diseases are the most common cause of death in diabetic patients. There is growing evidence for the assumption that diabetes can lead to systolic and diastolic cardiac dysfunction without other obvious causes for cardiomyopathy.

AIM: This study aimed to Assess subclinical left ventricular (LV) dysfunction in type 1 diabetic children by global longitudinal strain (GLS) using 2 D speckle tracking.

PATIENTS AND METHODS: The study is a prospective clinical study include thirty children with type 1 Diabetes mellitus. A 30 matched age and sex healthy children used as a control group. All subjects in the study subjected to: Full history taking, full clinical examination, routine laboratory investigations (CBC, Hb A1c, Lipid profile) and Echocardiographic study: 2–D conventional Echocardiography and GLS using 2 D speckel tracking.

RESULTS: Comparative analysis between cases and controls regarding LV systolic function in children with type 1 Diabetes Mellitus and matched healthy controls as regard to ejection fraction %, was demonstrated that percentage among cases ranged between 60 and 70 % with a median of
62.5% and among controls it ranged between 62 and 70 % with a median of 65%. The mean EF % was lower in cases (65.1 ± 2.3 %) in comparison with controls (67.9 ± 1.4 %) and this relationship was not statistically significant (p > 0.07).
In the same way, GLS measures among cases ranged (from -22 to - 14%) with a median of -19.5%, though, among controls it ranged (from 22 to -20%) with a median of -21%. Type 1 DM cases had lower mean GLS (-18.8 ± 2.1%) in comparison with controls (-21.1 ± 0.7%). Multivariate regression analysis of the following parameters: haemoglobin level, WBCs count, LDL level, HbA1c level, ejection fraction % and GLS. From the previous parameters, the risk of diabetic cardiomyopathy was significantly correlated to LDL level, HbA1c level and GLS with a p value (0.02, 0.001 and 0.002 respectively).

CONCLUSION: Type 1 DM children have subclinical LV dysfunction despite normal EF. GLS is more sensitive than conventional Echo in detection of early LV dysfunction in children with type 1 DM.

RECOMMENDATION: GLS is a useful diagnostic tool for early prediction of left ventricular affection in type 1 diabetic children.

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