



CARDIOVASCULAR RISK AND TYPE 1 DIABETES IN ADOLESCENT: EARLY ECHOCARDIOGRAPHIC CHANGES AND METABOLIC STATE, STUDY ON A COHORT OF PATIENTS



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INTRODUCTION

Children with type 1 diabetes are at higher risk to develop early adult-onset cardiovascular disease. Although cardiovascular complications are uncommon in children, some studies have pointed out diabetic cardiomyopathy, the existence of cardiac dysfunction in patients with type 1 diabetes mellitus (DM) even in the absence of ischemic, valvular, or hypertensive heart disease. It is due to early complex metabolic disturbance in cardiomyocytes that lead to morphological and functional abnormalities of the myocardium. The aim of this study is to look for early echocardiographic changes in a group of adolescents with type 1 diabetes mellitus.

MATHERIALS AND METHODS

This study includes 30 adolescent affected by type 1 diabetes mellitus without complications (mean age $14,6 \pm 1,83$ years) and 30 healthy adolescent (mean age $14 \pm 1,52$ years). Left ventricular diastolic function and remodeling were assessed by conventional Doppler color flow echocardiography.

RESULTS

1) Diabetic group VS control group

- Compared to the control group children with diabetes showed:
- increased left ventricular early filling deceleration time in the patients with diabetes (p-value= 0,009).

	Control group	DMT-1	p-value
E/A	$1,88 \pm 0,34$	$1,83 \pm 0,50$	0,770
MV dt	$164,56 \pm 62,08$	$225,23 \pm 77,66$	0,009

- increased left ventricular wall thickness.

	Control group	DMT-1	p-value
IVSd (mm)	$6,84 \pm 1,03$	$8,43 \pm 1,55$	<0,001
LVEDd (mm)	$44,52 \pm 4,09$	$43,74 \pm 5,74$	0,543
LVPWd (mm)	$6,58 \pm 1,17$	$8,38 \pm 1,83$	<0,001

2) Duration of the disease

- There was correlation between disease duration and interventricular septum thickness (p-value 0,012)..

	Time of illness < 9 years	Time of illness > 9 years	p-value
IVSd (mm)	$7,91 \pm 1,40$	$9,34 \pm 1,41$	0,012
LVEDd (mm)	$43,45 \pm 5,29$	$44,23 \pm 6,69$	0,725
LVPWd (mm)	$8,06 \pm 1,80$	$8,95 \pm 1,84$	0,206
E/A	$1,87 \pm 0,50$	$1,77 \pm 0,51$	0,607
MV dt	$207,78 \pm 66,03$	$255,36 \pm 89,81$	0,107

3) HbA1c level

- Results showed a significant decreased E/A ratio and increased early filling deceleration times in in patients with HbA1c level > 8% (p-value 0,002, p-value 0,023, respectively).

	HbA1c < 8%	HbA1c > 8%	p-value
IVSd (mm)	$8,21 \pm 1,77$	$8,76 \pm 1,11$	0,345
LVEDd (mm)	$44,16 \pm 6,66$	$43,10 \pm 4,19$	0,631
LVPWd (mm)	$8,72 \pm 1,88$	$7,89 \pm 1,71$	0,230
E/A	$2,05 \pm 0,47$	$1,51 \pm 0,36$	0,002
MV dt	$176,75 \pm 55,72$	$250,88 \pm 80,85$	0,023

CONCLUSION

Adolescents with type 1 diabetes **may exhibit early changes in left ventricular modelling and function**. A chronic worse glycemic control (HbA1c level and diabetes duration) may be the main risk factor for these alterations. Further studies on a larger sample, including speckle tracking echocardiography may allow quantification of these anomalies and detection of patients most at risk for cardiovascular dysfunction.