Does obesity influence ventricular repolarization in children?

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Introduction and purpose

- Ventricular repolarization changes lead to sudden cardiac death in obese individuals.
- Our aim is to investigate the relationship between ventricular repolarization changes, echocardiographic parameters with antropometric measures and metabolic syndrome laboratory parameters in obese children.

Conclusion

- QT/ QTc interval prolongation and increase in QT/QTc dispersions on ECG may be found at early ages.
- Subclinical left ventricular systolic dysfunction may also be detected on echocardiography in obese children.
- Further investigations are necassary for evaluation of probable rhythm disturbances.

Methods:

Patients

- 163 subjects (81 obese/82 control)
- Obese patients subdivided into groups; metabolic syndrome (MS, n:25) and non metabolic sydrome obese (NMSO, n:56) groups
- Antropometric measures, plasma fasting glucose, fasting insulin, lipid profile, QT/QTc interval, QT/QTc dispersions left ventricular systolic measurements performed

Measurement technique

- Philips iE33 xMATRIX echocardiograpy device ,2.5 and 3.5 MHz transducers. M-Mode, 2-D ve pulsed-continuous and colored Doopler imagings
- M-mode echocardiograpy withTeichholtz method left ventricular systolic functions *(interventricular septum diameter and left ventricular end systolic and diastolic diameters, friction and ejection fractions)*
- Cardiocure Model EKG 2000 ,12 lead ECG measured
- *Bazett's formula* for QTc measurement

Statistics

- SPSS (Statistical Package for Social Sciences) for Windows 20.0 packet programme
- Results expressed as mean ±SD
- T-test for comparison of % between groups
- T test and Mann-Whitney U tests for comparing means

Results :

- Follow up time: aproximately 4 years
- QT ve QTc dispersions were significantly higher in obese group regarding to healty controls.
- Difference between QT ve QTc dispersions in MS group compared with NMSO and control group and in NMSO group compared with control group was statistically significant . (Table 1)
- QT and QTc dispersion was higher in obese group regarding to control group. (Figure 1,2)
- Left ventricular myocardial index (LVMI) was significantly high and EF was low in obese group regarding control group. (Figure 3,4)

	Control	NMSO	MS	p		
				MS-NMSO	C- NMSO	C-MS
QT dispersion	36.6±18.5	46.4±17.5	64.0±23.8	**0.001**	**0.010**	**0.001**
QTc disersion	43.7±22.5	55.6±21.5	78.2±33.2	**0.001**	**0.015**	**0.001**
Max QTc(m/sn)	397.4±25.5	413.2±27.3	425.2±45.5	0.292	**0.008**	**0.001**
Min QTc (m/sn)	354.0±20.0	356.6±25.5	347.±33.3	0.376	1.000	0.739
Max QT (m/sn)	338.1±24.1	349.6±24.2	354.4±21.2	1.000	**0.037**	**0.023**
Min QT (m/sn)	301.5±26.1	303.2±22.5	290.4±17.4	1.000	1.000	0.129

Table 1: ECG measurements
(C : Control MSO : Metabolic Syndrome Obese NMSO : Metabolic Syndrome Obese)

Figure 1: QTc Dispersion Change

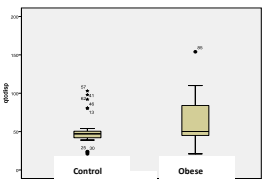

Figure 2: QT Dispersion Change

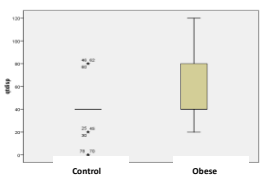

Figure 3 : LVMI Change

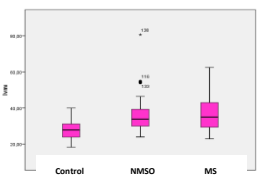

Figure 4: EF Change