creased Arterial stiffness may impair LV function. We investigated whether first degree relatives of diabetics have similarly impaired coronary microcirculation, LV myocardial strain and twisting with patients with diabetes as assessed after an oral glucose tolerance test (OGTT).

Methods: In 76 subjects without known diabetes a standard 75-gr OGTT was performed and glucose and serum insulin levels were measured at 0, 30, 60, 90 and 120 min after glucose load. We measured a) pulse wave velocity (PWV(a-mix)) and augmentation index (AI(%) Arteriograph, Tensiometer). b) E’ and a’ mitral annular velocities and their ratio E’/A’ using tissue Doppler imaging, LV longitudinal (GLS-%), strain, systolic (LSSS-tls) and diastolic strain rate (LSSRSE, twisting (Te-deg), peak twisting (Tw) and untwisting (unTw.deg/sec) velocity using speckle track- ing echocardiography c) coronary flow reserve (CFR) of the LAD after adenosine infusion using Doppler echocardiography at baseline. We assessed insulin re- sistance using the insulin sensitivity index (ISI) which includes both insulin and glucose levels at 0 and 120 min. Results: 59 relatives, 17 of whom (22%) were first degree relatives of diabetics had normal OGTT (relatives), 20 had normal OGTT and no family history of diabetes (normals), and 20 had abnormal OGTT (diabetics). Age, sex and BMI were similar between subgroups (p=ns). Compared to normals, diabetics and relatives had both higher baseline PWV(a) (93.2±2 vs. 81.2±2 vs. 72.1±1.6), AI (23.9±9 vs. 24.1±1.8±15), insulin (median 14 vs. 15 vs. 10 µU/mL), and lower ISI (50±24 vs. 73±22 vs. 93±17), baseline E’/A’ (0.75±0.2 vs. 0.95±0.2 vs. 1.1±0.3), LSSRSE (0.80±0.1 vs. 1.1±0.15), LSSRSE (0.88±0.1 vs. 1.1±0.15), in the LV as 1.3±1.6 p=0.05) Te (15±7.4 vs. 13±5.2 vs. 17:7) and unTeVeolocity (-85±31 vs. -94±40 vs. 116±36) and lower CFR (2.6±1.3 vs. 2.9±0.9 vs. 3.0±0.6) (p<0.05 for all comparisons). ISI was related with PWV (r=0.37, CFR (r=0.40), LSSRSE (r=0.23), LSSRSE (r=0.31), Tevelocity (r=0.33), unTeVeolocity (r=0.26), E’/A’ (r=0.52) (p<0.05 for all asso- ciates) in relatives and diabetics. PWV was related with LSSRSE, Te, TWelocity, unTeVeolocity and E’/A’ (p<0.05).

Conclusions: First degree relatives and diabetics have increased arterial stiffness, abnormal wave reflection and decreased CFR compared to normals on the grounds of insulin resistance. Insulin resistance is also related with abnormal LV myocardial strain, twisting and untwisting likely because of increased arterial stiffness and impaired coronary microcirculatory function.

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QT prolongation is frequently observed in obesity with and without the metabolic syndrome and can be reversed by long term weight reduction
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Background: Prolongation of the QT interval has been related to various compo- nents of the metabolic syndrome (MetS), including type 2 diabetes and obesity. The underlying mechanisms of the QTc prolongation in these subjects are still un- known. We conducted a prospective study to determine ventricular repolarization in parallel to detailed metabolic parameters during the course of a standardized weight reduction.

Methods: In a prospective longitudinal study the QTc-interval (QTc) was deter- mined in 250 subjects (n=221, mean BMI 40.8±8.2 kg/m²) with and without the metabolic syndrome and referred to the University Hospital Regensburg. Obesity (BMI ≥ 30 kg/m²) and a body mass index (BMI) ≥ 18.5±9.9 kg. In addition, age- and sex matched healthy lean subjects (n=68) served as controls.

Results: The QTc in the obese was significantly longer than in controls (420±26 vs. 408±24 ms, p<0.05), but was more pronounced in subjects with in- sulin resistance (423±28 ms, p<0.005). Patients with QTc prolongation (≥ 440 ms (n=44) had a significantly higher BMI, higher fasting glucose and HOMA lev- els, but lower serum calcium levels (2.27±0.12 vs. 2.33±0.11 mmol/l, p<0.01) and elevated serum alkaline phosphate concentrations (79.20 vs. 71.18 UI, p<0.01), implicating impaired calcium/phosphate metabolism in the obese. Dur- ing the course of weight reduction the QTc was found to be almost parallel to BMI (r=0.277, p<0.001) but did not change significantly and did not change significantly after weight reduction (r=0.23, p=0.001). The correlation coefficient between BMI and HOMA was r=0.22 (p<0.001). Over- all, 476 (30.4%) had prediabetes. The prevalence was 36.6% among men and 25.2% among women (p<0.0001). A diagnosis of prediabetes was present in 25% of the MetS and 23% of the non-MetS. The prevalence of prediabetes was higher in women (36.3% vs. 26.1%) and in the MetS (28.2% vs. 21.3%).

Conclusions: QT prolongation is a common finding in severe obesity and is associated with lower serum calcium levels, probably due to impaired cal- cium/phosphate metabolism. Interestingly, both QTc time and calcium levels can be positively influenced by successful weight reduction in these subjects.