GW23-e1077

RE-EVALUATION OF TWO-DIMENSIONAL STRAIN IN THE PATIENTS WITH TYPE 2 DIABETES MELLITUS

doi:10.1136/heartjnl-2012-302920ad.23

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Objectives Based on the ventricular-arterial coupling, the longitudinal strain (LS) of myocardium in the patients with type 2 diabetes mellitus (DM) were discussed in detail.

Methods Eighty patients with DM were divided into two groups, normal left ventricular ejection fraction (EF) group (DMN, EF≥50%, n=40) and abnormal EF group (DMA, EF <50 %, n=40). At the same time, 42 healthy volunteers were selected as the control. The Stroke works (SW), rate-pressure product (RPP), systemic vascular resistance index (SVRI) and arterial elastance index (Ea) were measured respectively. Longitudinal strain (SL) of myocardial segment including base (SL_{BA}), papillary muscle (SL_{PM}) and apex (SL_{AP}) were analysed by two-dimensional speckle tracking imaging and the mean values of 6 segments at the same level were regarded strain value at this level.

Results

1. Group DMA was compared with control group and was significant difference in RPP, Ea, SVRI and SW ($p<0.01$). There were significant differences in SL_{BA}, SL_{PM} and SL_{AP} among DMN, DMA and control groups ($p<0.01$).
2. SL_{BA}, SL_{PM} and SL_{AP} were correlated positively with Ea and SVRI ($p<0.01$). The longitudinal strain had reverse correlation with SW and RPP ($p<0.01$), while positively with EF and fractional shortening (FS) ($p<0.01$).
3. DMN compared with control group, the ROC analysis showed that the under-ROC curve area of SL_{BA}, SL_{PM} and SL_{AP} were 0.857, 0.862 and 0.832 respectively, but there was no significant difference among them ($p>0.05$). On the other hand, the ROC analysis between DMA and DMN group indicated that the under-ROC curve area of SL_{BA}, SL_{PM} and SL_{AP} were 0.720, 0.782 and 0.942, moreover $SL_{AP}>SL_{PM}>SL_{BA}$.

Conclusions To patients with DM, ventricular-arterial coupling and SL decreased in synchronism. Ventricular-arterial uncoupling, SL would be asynchronous, power decrease, and increase oxygen.