

GW23-e0884

**EVALUATION OF LEFT VENTRICULAR FUNCTION BY TWO-DIMENSIONAL LONGITUDINAL STRAIN IN PATIENTS WITH FAMILIAL HYPERCHOLESTEROLAEMIA**

doi:10.1136/heartjnl-2012-302920ad.20

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**Objectives** To evaluate the left ventricular function of global and each section through left ventricular longitudinal strain in familial hypercholesterolaemia (FH) patients with two dimensional strain imaging (2DSI).

**Methods** Thirty-nine patients with FH and 33 volunteers underwent 2DSI. The long axis myocardial peak systolic strain (S), peak systolic strain rate (SRs), peak early diastolic strain rate (SRe) and peak late diastolic strain rate (SRa) of 18 segments in different left ventricular walls and overall S, SRs, SRe and SRa were measured.

**Results**

1. The subjects enrolled in 72 cases which analysis 1296 segments, and tracking successful rate was 97.38%. The SRe of two chamber of cardiac ( $1.94 \pm 0.59$  vs  $2.28 \pm 0.55$ ), three chamber of cardiac ( $1.88 \pm 0.52$  vs  $2.30 \pm 0.57$ ), four chamber of cardiac ( $2.00 \pm 0.58$  vs  $2.37 \pm 0.43$ ) and the overall ( $1.895 \pm 0.50$  vs  $2.32 \pm 0.48$ ) in FH group was less than the control group ( $p=0.01$ ); The SRa of three chamber of cardiac ( $1.06 \pm 0.43$  vs  $1.10 \pm 0.52$ ), two chamber of cardiac ( $0.92 \pm 0.30$  vs  $1.15 \pm 0.69$ ), four chamber of cardiac ( $1.07 \pm 0.41$  vs  $1.23 \pm 0.61$ ) and the overall ( $1.02 \pm 0.35$  vs  $1.16 \pm 0.55$ ) in FH group was less than the control group, but the difference was no statistically significant ( $p>0.05$ ). The SRe of posterior basal segment to apical segment, anterior septal basal segment, posterior septal basal segment to apex segment, lateral basal segment, inferior basal segment to middle segment and anterior basal segment in FH group was less than the control group ( $p<0.05$ ). The SRa of anterior basal segment, inferior basal segment and lateral basal segment in FH group was less than the control group ( $p<0.05$ ).
2. The three chamber of cardiac, two chamber of cardiac, four chamber of cardiac peak systolic strain and peak systolic strain

rate in FH group was lower than the control, but the difference was not statistically significant ( $p>0.05$ ); overall SRs in the FH group was decreased ( $-1.32\pm 0.29$  vs  $-1.52\pm 0.24$ ) ( $p=0.01$ ). The S of posterior basal segment and anterior basal segment in FH group decreased ( $p<0.05$ ). The SRs of posterior basal segment, posterior septal basal segment, lateral basal segment and to the middle segment, inferior basal segment and anterior basal segment to the middle segment in FH was lower than the control group ( $p<0.05$ ).

#### Conclusions

1. Using STI can detect left ventricular overall and segmental diastolic function impairment in FH patients through longitudinal strain in the early stage, in which SRe is more sensitive than SRa.
2. Using STI can detect left ventricular overall and segmental systolic function impairment in FH patients through longitudinal strain in the early stage, in which SRs is more sensitive than S.