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VALUE OF VELOCITY VECTOR IMAGING IN THE DETECTION OF THE LEFT VENTRICULAR SYSTOLIC DYSFUNCTION IN EARLY DIABETIC RATS

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Objectives The aim of this study was to investigate the left ventricular systolic dysfunction in early diabetic rats with velocity vector imaging (VVI).

Methods The diabetes mellitus (DM) group comprised 12 male diabetic rats which were induced with streptozotocin. The control group comprised 12 normal male rats with matching of DM group. All rats underwent conventional echocardiography and VVI exam 5 weeks after diabetic model established. Two-dimensional echocardiographic cine loops were obtained from the left ventricular short-axis views at the papillary muscle level and were analysised with Siemens Sygno US Workplace 3.01 software. The peak systolic radial velocity (Vs), radial strain (SRs), radial strain rate (SRRs), circumferential strain (SCs), circumferential strain rate (SRCs) and the average of the every parameter in left ventricular six segments at the papillary muscle level were compared between the 2 groups.

Results There was no statistical difference in every conventional echocardiographic parameter (wall thickness, left ventricular size, left ventricular ejection fraction and fractional shortening) between the two groups. Compared with the control group, the SCs of interior wall (IW), SRCs of IW and anterior-interventricular septum (AS) in the DM group were significantly lower (−11.79 ±1.42 vs −13.59±2.51, $p<0.05$; −2.79±0.99 vs −3.95±1.32, $p<0.05$; −2.14±0.83 vs −3.22±0.91, $p<0.01$, respectively), and other VVI parameters in the DM group reduced, but there were not significant differences between the two groups.

Conclusions Velocity vector imaging can be used to detect the left ventricular systolic dysfunction in early diabetic rats and become an important tool in diagnosis of the diabetic cardiomyopathy. Circumferential strain (SCs) and strain rate (SRCs) may be more sensitive indices in detecting myocardial impairment.