Table 1 The time intervals on the mitral flow and TDI in three groups

	Control group (n=30)	E/E' 8-15 (n=18)	E/E' >15 (n=22)
R-pE (ms)	522.5±20.9	521.6±20.7	496.8±24.6
R-pE' (ms)	488.4±15.4	485.3±33.1	478.2±21.1
P-pA (ms)	152.5±11.1	155.3±18.0	158.3±24.3
P-pA' (ms)	157.2±16.3 *	121.1±13.0 *	91.6±20.5*
R-onset E (ms)	442.4±27.3	443.0±19.3	412.5±28.9
R-onset E' (ms)	432.2±24.5	422.5±29.2	409.8±39.9
P-onset A (ms)	95.1±20.9	93.3±25.9	74.7±22.3
P-onset A' (ms)	71.1±14.3*	63.2±19.0*	49.7±12.3*

Statistic significant difference $p < 0.001$

P-onset A, the onset of P-wave on the ECG to the onset of A-wave on the transmitral flow; P-onset A', the onset of P-wave on the ECG to the onset of A'-wave on the LV septal wall of tissue Doppler imaging; P-p A', the onset of P-wave on the ECG to the peak A'-wave on the LV septal wall of tissue Doppler imaging; P-pA, the onset of P-wave on the ECG to the peak A-wave on the transmitral flow; R-E', peak R-wave on the ECG to the peak E'-wave on the LV septal wall of tissue Doppler imaging; R-onset E, peak R-wave on the ECG to the onset of E-wave on the transmitral flow; R-onset E': peak R-wave on the ECG to the onset of E'-wave on the LV septal wall of tissue Doppler imaging; R-pE, peak R-wave on the ECG to the peak E-wave on the transmitral flow.

to the ratio of E/E': (1) group 1: E/E' from 8 to 15; (2) group 2: E/E' >15. The measurements were: the time intervals from the R-wave on the ECG to the peak E-wave and the onset of E-wave on the transmitral flow (TMF) (R-pE, R-onset E), to the peak E'-wave and onset of E'-wave on the LV septal wall of TDI (R-pE', R-onset E'); The time intervals from the onset of P-wave on the ECG to the peak A-wave and onset of A-wave on the TMF (P-pA, P-onset A), to the peak A'-wave and onset of A'-wave on TDI (P-pA', P-onset A').

Results The time intervals were shown in table 1. The time intervals of P-pA' and P-onset A' were significantly decreased in group 1 and group 2 compared to the control group respectively (121.1 ± 13.0 , 91.6 ± 20.5 vs 157.2 ± 16.3 , $p < 0.001$), (71.1 ± 14.3 , 63.2 ± 19.0 vs 49.7 ± 12.3 , $p < 0.001$).

Conclusion The time intervals of P wave to A wave on TDI changed earlier than on the pulsed Doppler when the LV filling pressure increased, and it may be a useful new method to evaluate the LV diastolic function in patients with heart diseases.

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LV DIASTOLIC FUNCTION AND FILLING PRESSURE ASSESSMENT USING THE TIME INTERVALS CHANGES ON THE MITRAL INFLOW AND MITRAL ANNULAR VELOCITIES

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Background The aim of our study was to evaluate left ventricular (LV) function using the time intervals between mitral inflow and mitral annular velocities.

Methods 40 patients (mean age: 42 years) with heart failure and 30 age-matched controls (mean age: 41 years) were enrolled. Patients were classified into two groups according