SERIAL ECHOCARDIOGRAPHIC ASSESSMENT OF VENTRICULAR FUNCTION USING TISSUE DOPPLER IMAGING IN VERY LOW BIRTHWEIGHT INFANTS WITHIN FIRST 7 DAYS OF LIFE

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Background and aims: We aimed to evaluate early changes of ventricular function in very low birthweight (VLBW) infants using tissue Doppler imaging (TDI) echocardiography.

Methods: Consecutive assessment of echocardiography from 3h to days 7 was performed for 102 VLBW infants weighing less than 1500g, who were admitted to Kakogawa Municipal Hospital between September 2004 and August 2007. TDI was assessed at a lateral annulus both of mitral valve (MV) and tricuspid valve (TV). Peak annular velocities in systole (Sa), early diastole (Ea), and late diastole (Aa) were measured both on MV and TV.

Results: Mean gestational age of patients was 28.2 weeks (21.0-33.9), and mean birthweight was 1057g (360-1496). Trans mitral (MV) Sa fell down significantly from 3h to 24h ($p < 0.0001$), then remained to a steady level of 4 cm/second. There was no significant change in time-course of MV Ea within 7 days (4.1 ± 1.0 cm/second), but values of Ea in premature group were significantly lower than those in more mature group ($p < 0.01$) before 12h of life. Left ventricular E/Ea appeared to keep a steady level of 7.1 ± 2.7 , regardless of postnatal hours or their gestational age. Trans tricuspid (TV) Sa also fell down significantly from 3h to 12h ($p < 0.001$), then kept a constant value (around 5 cm/second). Values of TV Ea appeared to decrease gradually from 3h to days 7 ($p < 0.0001$). Right ventricular E/Ea also showed no significant change throughout the early neonatal period (7.9 ± 2.8).

Conclusions: In very premature infants, TDI velocities may reflect both systolic and diastolic ventricular function in the early neonatal period.