

Tissue Doppler Imaging in very preterm infants. The alteration of myocardial performance during the first 24 hours of life.

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Introduction (or Basis or Objectives): Tissue Doppler Imaging (TDI) is a new tool for assessment of myocardial function which has not been much applied in preterm infants born before 32 weeks gestation. During the first day(s) of life, these infants go through a substantial circulatory transition, and some infants, especially the youngest ones, are in need of circulatory support in order to maintain adequate blood pressure and flow. More knowledge about cardiac performance during this transitional phase could potentially guide the choice of cardiac/circulatory support.

Methods: In a total of 50 newborn, preterm infants, echocardiographic examination for assessment of structural and haemodynamic parameters was performed at 5, 12 and 24 hours after birth. If feasible, TDI was recorded for off-line measurement of annular systolic and diastolic velocities of the left and right ventricle, as well as displacement of both ventricles.

Results: One or more TDI measurements were obtained in 33, 20 and 22 infants at the 5, 12 and 24 hours exams respectively. We found a significant reduction of systolic (S') and diastolic (D') velocities as well as displacement of both ventricles from 5 to 12 hours age. There was a slight, but not significant increase of all parameters from 12 to 24 hours age.

Age at exam	5 h	12 h	24 h	p
cTDI S' LV (cm/s)	1.8 (0.7) * n=32	1.3 (0.4) * n=18	1.5 (0.6) n=22	0.002
cTDI S' RV (cm/s)	2.8 (0.9) * n=33	2.2 (0.9) * n=20	2.5 (0.9) n= 21	0.01
cTDI D' LV (cm/s)	2.3 (1.1) * n=32	1.8 (0.8) * n=18	2.1 (0.9) n=22	0.035
cTDI D' RV (cm/s)	4.1 (1.6) * n=33	2.8 (0.9) * n=20	3.3 (1.5) n=21	<0.001
Dis LV (mm)	1.9 (0.9) * n=30	1.4 (0.7) * n=18	1.8 (0.8) n=22	0.024
Dis RV (mm)	3.3 (1.2) * n=31	2.2 (1.2) * n=20	2.9 (1.3) n=21	0.002

cTDI S' = colour TDI peak systolic velocity; cTDI D' = colour TDI peak diastolic velocity; LV = left ventricle; RV = right ventricle; Dis = displacement. P value pertains to the difference between the 5 and 12 hour exams (*)

Conclusions: By applying colour TDI to a group of very preterm infants, we found a significant decrease in several parameters of myocardial performance from 5 to 12 hours age. Larger studies are needed to confirm these findings.