

# Evaluation of right ventricular function assessed by color-coded tissue Doppler in fetuses with hypoplastic left heart (HLH)

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## Background

The outcome of patients with HLH is influenced by right ventricular function. The study aimed to investigate whether differences in right ventricular function of fetuses with HLH may be present during gestation.

## Methods

Prospective study of 23 fetuses with HLH and 34 normal, gestational age matched controls. Color coded tissue Doppler derived inflow and outflow velocities were assessed.

Isovolumetric time intervals, ejection time, E'/A' ratio as well as the tissue Doppler derived myocardial performance index (MPI') were calculated.

## Results

In the right ventricle color coded tissue Doppler interrogation revealed a significantly lower E'/A'-ratio in the HLH group compared to controls ( $p < 0.05$ ). Isovolumetric contraction time (ICT') and relaxation time (IRT') were significantly prolonged compared to controls. Fetuses with HLH showed a significantly higher MPI'. Values for systolic and diastolic peak velocities did not show significant differences among both groups. Values for MPI' and ICT' significantly increased over gestation in HLH fetuses.

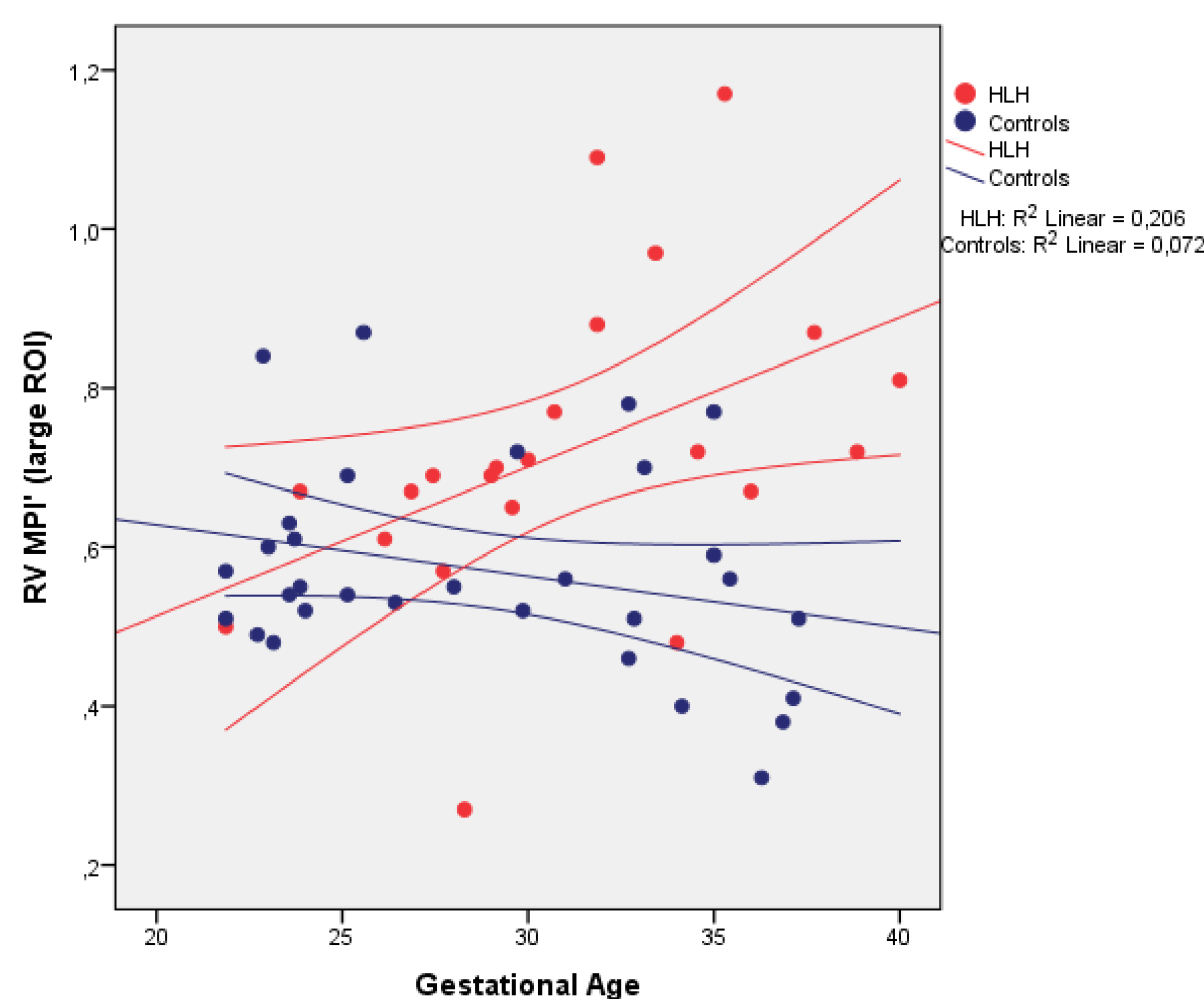


Fig.1: Changes in right ventricular MPI' over gestation for controls and HLH fetuses

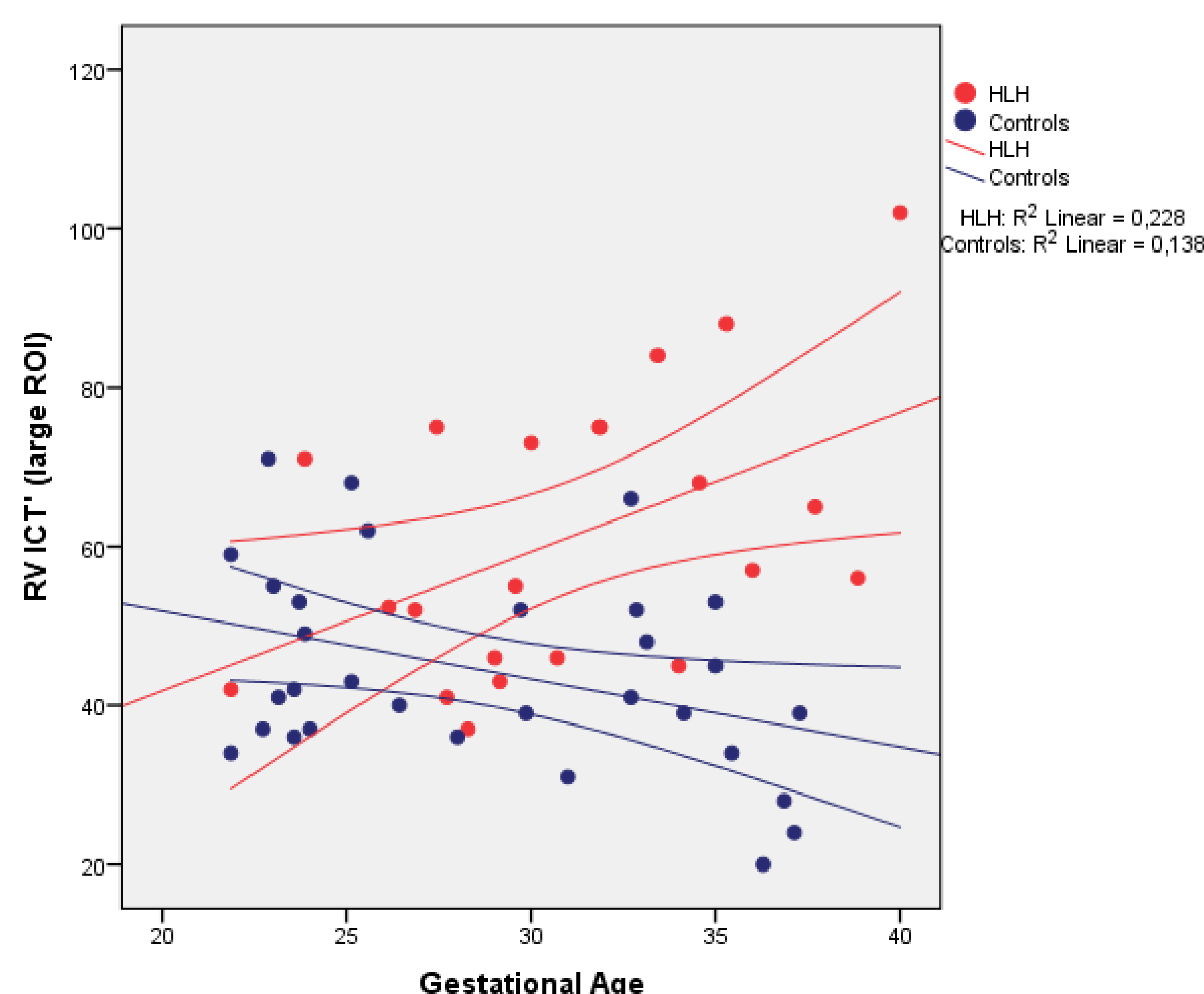


Fig.2: Changes in right ventricular ICT' over gestation for controls and HLH fetuses

Variable	HLH group	Control group	p-value
Gestational age (weeks)	31,05 ± 4,7 (23)	28,7 ± 5,3 (34)	0,087
C-TDI large ROI			
Right ventricle			
S' (cm/s)	15,21 ± 4,9 (22)	15,45 ± 7,0 (31)	0,881
E' (cm/s)	13,13 ± 7,4 (19)	17,96 ± 10,4 (31)	0,061
A' (cm/s)	28,05 ± 13,9 (22)	26,03 ± 13,7 (31)	0,603
E'/A' ratio	0,52 ± 0,2 (19)	0,71 ± 0,3 (31)	0,009*
ICT' (ms)	61,29 ± 17,5 (22)	44,32 ± 12,6 (31)	0,000*
ET' (ms)	177,97 ± 26,3 (22)	176,74 ± 15,8 (31)	0,846
IRT' (ms)	63,55 ± 13,6 (22)	55,55 ± 12,5 (31)	0,035*
MPI'	0,72 ± 0,2 (22)	0,57 ± 0,1 (31)	0,004*

Fig.3: Echocardiographic findings for right ventricular function of HLH fetuses and controls. Data are expressed as mean ± SD (n), \*Statistically significant ( $p < 0,05$ )

## Conclusion

The results show that an altered right ventricular function in HLH fetuses might begin antenatally. Confirmation of these findings with Doppler independent techniques will hopefully allow further exploration of ventricular function in HLH fetuses. This could influence parental counseling and postnatal management strategies.