Alterations of ductus venosus velocity ratios in monochorionic twins with Sfgr

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Objective
Fetal survival relatively depends on the cardiovascular function in the fetus with intrauterine growth retardation, and fetal ductus venosus (DV) plays an important role in the assessments of cardiac function. Ductus venosus doppler evaluation has increased our depth of understanding of fetal conditions. The aim of this study was to explore the DV pulsatility index for veins (PIV), and its velocity ratios (S/a, where S indicates ventricular systole and a represents active ventricular filling during atrial systole) alterations in monochorionic twins complicated with selective intrauterine growth restriction (sIUGR).

Methods
This is a prospective cohort study of MCDA pregnancies complicated with sIUGR. All patients were under expectant management during the observation period. Pregnancies with fetal abnormalities or maternal medical complications were excluded. 55 cases of monochorionic diamniotic twin pregnancies (MCDA) from 19 to 36 weeks with CRL at 11-14 week gestational ages (GAs) were entered the study. All 110 fetuses were divided into 3 groups: Group 1 (Control), 40 fetuses from uncomplicated MCDA; Group 2, larger twins from 35 cases with sIUGR; Group 3, the small twins from 35 cases with sIUGR. The ductus venosus doppler examinations were performed by the same person and measured with standard method. All data were processed by SPSS, mono factor analysis of variance was used to compare the difference between groups.

Results
DV pulsatility index for veins and velocity ratios by ultrasound were performed in all groups and cases. There were no significant difference among groups with gestations, the mean GA of pregnancies with sIUGR was 26.0 (22.0-34.0) weeks, and uncomplicated MCDA was 27.7 (19.0-35.7) weeks, p > 0.05. DV pulsatility index and velocity ratios were significantly higher in the small twins than in the larger one in pregnancies complicated with sIUGR (Group2 vs. Group 3: DV-PIV 0.67±0.39 vs. 0.83±0.28, p=0.02; DV-S/a 2.1±0.52 vs. 3.0±0.92, p < 0.001). Similarly, it was significantly higher compared to the uncomplicated MCDA (p < 0.001). However, there were no difference between the larger fetuses from monochorionic twins with sIUGR and normal MCDA twins.

Conclusion
Ductus venous flow and velocity were changed in the small twins in monochorionic twins with sIUGR. It is a reminder that increased resistance and fetal heart dysfunction appear in the intrauterine growth restricted fetuses, and these will guide timing of delivery.