Neonatal outcomes and abnormalities in transfontanellar ultrasound in fetal growth restriction fetuses with abnormal umbilical Doppler

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Objective
To compare the neonatal outcomes and abnormalities in neonatal transfontanellar ultrasound of fetal growth restricted (FGR) with absent and reversed end-diastolic flow (AREDF) of the umbilical artery fetuses (group A) with premature delivered infants (group B).

Methods
This is a retrospective case-control study. All patients were followed by the Fetal Medicine Center at Albert Einstein Jewish Hospital and delivered at the same hospital in the last 5 years. In group A, all fetuses with prenatal diagnosis of FGR (fetal weight estimated by ultrasound below the 10th percentile) and with AREDF of the umbilical artery, were included. In group B we included premature delivered infants with antenatal normal weight and Doppler, matched for gestational age with group A. We analyzed data on gestational age and type of delivery, birth weight, Apgar score, required of neonatal resuscitation, admission in neonatal intensive care unit and neonatal transfontanellar ultrasound.

Results
In group A we had 23 infants and 27 in group B. There wasn't differences on gestational age, group A 29.5 weeks and group B 29.1 weeks (p=0.926, t-student), and on type of birth (95% of cesarean section in each group). Group A had a mean birth weight of 936g and group B 1354g, with significant difference (p= 0.0005, t-student). We didn't find significant differences in 1 and 5 minutes Apgar score between the groups, 1 minute Apgar score mean in group A and B was 6 and 5 minute average was 8 in both group. In group A 50% of infants needed resuscitation and 37% in group B, but the difference wasn't significant (p=0, 12, x2). There was difference in days of admission, group A had an average of 88 day and group B 54 days (p=0, 017 t-student). We had 1 inapartum death and 2 neonatal deaths (with 1 and 13 days) in group A. No deaths occurred in group B. Analyzing the neonatal transfontanellar ultrasound we considered two main abnormalities: intraventricular hemorrhage and periventricular leukomalacia. Intraventricular hemorrhage showed significantly higher in Group A 39,1% compared to Group B 22,2% (p=0.000, x2). Periventricular leukomalacia showed no difference between groups (p=0, 27, x2), with 17,39% group A and 22,2% group B. One infant from group A had an extensive extra axial hemorrhage and developed isquemic areas.

Conclusion
FGR with AREDV is an indication of severe placental insufficiency and related to increased morbi-mortality with lower birth weight, more days of admission and higher incidence of neonatal intraventricular hemorrhage regardless of gestational age of birth and type of delivery when comparing with premature infants. Further studies have can be done to investigate possible neurological sequelae in childhood and adult life.