

Severe Growth Restriction: No Correlation between Doppler Flussimetry and Fetal Condition

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Abstract

Optimal management of severe early fetal growth restriction presents one of the greatest challenges in obstetrics. At present, a combination of several different monitoring modalities is used, including arterial and venous Doppler ultrasonography plus assessment of short-term fetal heart rate variation, without consensus on which of these should trigger the decision to deliver.

Pathological Doppler waveforms in the ductus venosus (DV) have been found to be associated with adverse outcome. However it is not clear how long a fetus in utero can withstand changes in presence of altered flussimetry and which are, specifically, the effects related to them during extrauterine life. Optimal management of severe early fetal growth restriction presents one of the greatest challenges in obstetrics. At present, a combination of several different monitoring modalities is used, including arterial and venous Doppler ultrasonography plus assessment of short-term fetal heart rate variation, without consensus on which of these should trigger the decision to deliver.

Keywords Early fetal growth restriction; Monitoring modalities; Systolic blood flow velocity

Introduction

However it is not clear how long a fetus in utero can withstand changes in presence of altered flussimetry and which are, specifically, the effects related to them during extra uterine life.

We have recently come across such a patient, who was 2 para 0 at 27 weeks of gestation with an estimated fetal weight below the 5th (PFS= 450 gr \pm 10%) centile, anidramnios, absent/ reversed UA end- diastolic velocity, already diagnosed at 21 weeks of gestation and reversal of atrial systolic blood flow velocity in the DV (negative a wave). *Inverted transmittal* flow *E/A* ratio, tricuspidal insufficiency (II grade) and bilateral notch of uterine arteries were also detected. The obstetric history included 2 miscarriages at 10 and 11 weeks of gestation.

There were no signs of fetal abnormalities, with normal echocardiography and normal karyotype. There were no signs of infections, maternal PCR and leucocytes were normally

On weekly we performed ultrasounds including assessment of fetal growth and every day Doppler parameters, carrying out computerized fetal heart-rate analysis. Follow-up showed reversed flow during atrial contraction in VD. The current standard in our center would be to deliver a growth-restricted fetus with such a late stage of abnormality in the DV waveform (a-wave signal reaching the baseline or indicating reversed flow). However, we abstained from delivering these fetuses when the DV showed reversed flow because the fetal estimated weight was so slowly. The fetus was monitored for 17 days until the estimated fetal weight was compatible with neonatal survive. Every day BCF was controlled and every 2 days Doppler flussimetry was performed with control of intra-amniotic fluid index. Fetal estimated weight was calculated every week, until the fetus reached 450 gr.

Case Report

At 27 gestational weeks fetus was delivered with cesarean section. Apgar score was 6 on the 1st minute of life and 8 on the 5th minutes of life. No intubation was necessary at birth and the infant was observed in neonatal intensive care. No complications such as retinopathy, respiratory distress syndrome, necrotizing enterocolitis or intraventricular hemorrhage occurred. The infant was followed and discharged after six months. After 2 years he was in optimal condition. Pathological Doppler waveforms in the ductus venosus (DV) have been found to be associated with adverse outcome [1,2].

While we strongly believe that flow measurement in the DV is an important indicator of fetal condition, the present case present is an example in which DV pathology was not representative of the fetal condition. Caution is warranted when using single Doppler measurements to trigger delivery. A combination of various parameters constitutes the best approach. Although the study of blood flow of the DV is an important indicator of fetal condition, there are no reliable data in the literature about the exact correlation between these and the actual conditions in newborns. In our case the infant was in healthy condition despite the absence of diastolic flow in the umbilical artery for approximately seven weeks and despite persistence of negative wave A in the DV for 48 hours. The only parameter was always normal flow in the umbilical vein that has never been a pulse. The evaluation of the venous side of the fetal circulation will provide important information concerning fetal status due to the transmission of increased reverse flow in the inferior vena cava in pathologic situations, and DV may result in venous pulsations in the umbilical vein.

Although the combined use of Doppler velocity wave form analysis of fetal vessels and the ultrasonic estimation of fetal weight (or AC) seems to be the best method of both identification and evaluation of IUGR we are of opinion that fetal venous Doppler studies may give

additional information about the time frame and significance of the IUGR.

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