Identification of Small-for-Gestational-Age fetuses at risk of adverse perinatal outcome

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Objective
There are two different phenotypes of fetal growth restriction (FGR), determined by gestational age at onset of the disease and by the pattern of umbilical artery (UA) Doppler indices. In late-onset FGR, normal or only minimally elevated UA Doppler indices are usually observed. Distinguishing between healthy small fetuses or constitutional SGA, with a near-normal perinatal outcome, from those with late-onset growth restriction (the “true” FGR) with signs of abnormal fetoplacental function and a poorer perinatal outcome is therefore clinically relevant and necessary. The objective of this study was to identify criteria for predicting a sonographically adverse outcome in small-for-gestational-age (SGA) pregnancies in our institution.

Methods
This was a retrospective cohort study of singleton pregnant women with a diagnosis of SGA in the third trimester, with normal fetal anatomy and obtained from January 2012 to December 2014. We established 3 different groups at risk of adverse perinatal outcomes: estimated fetal weight (EFW) < 3rd centile; mean uterine artery (UtA) PI > 95th centile; fetal middle cerebral artery (MCA) PI < 5th centile. We considered an adverse perinatal outcome if there was an emergency caesarean delivery for a non-reassuring foetal status and/or metabolic acidosis, defined as the presence of a UA pH < 5th centile (7.15). Exclusion criteria were congenital malformations and infections, maternal consumption of illicit substances and contraindications for a vaginal delivery before the onset of labour.

Results
The study included 161 pregnancies with a suspected SGA fetus. Among them, 3 were excluded for breech presentation and elective caesarean section, 1 for having had more than one previous caesarean delivery, and 2 for the presence of a medical contraindication for vaginal delivery, leaving a final population of 155 fetuses. Of the total SGA pregnancies, 29.7% had an adverse outcome. We observed only 6 cases with a pathologic umbilical artery and in all cases, mild changes in the umbilical artery wave were detected. The group with MCA PI < 5th centile had the highest risk for an adverse outcome (44% versus 26.9%), with a rate of 12% of emergency caesarean sections versus 5.4% if there was a normal MCA PI, and 36% of neonatal acidosis versus 23.8%. Comparing the adverse outcomes in the group with a pathologic ACM and a pathologic UtA, we observed that the association had a significantly higher risk (33% versus 0% in the group with a pathologic ACM and a normal UtA). The risk for an adverse outcome in the group with UtA PI > 95th centile was 38.3% versus 25.9%. In the SGA pregnancies with a normal UtA, a normal MCA and normals UtA, we found a very low rate of emergency caesarean sections (4.4% in the group with EFW < 3th percentile versus 2.1% in the group with EFW > 3th percentile). In total, SGA fetuses at low risk accounted for 31.6% of the total number of pregnancies, in which only 20.4% of the adverse outcomes occurred; whereas SGA fetuses at high risk represented the remaining 68.4%, in which 38% of the adverse outcomes were found. The incidence of preeclampsia was very low in early onset FGR, 4.5%.

Conclusion
Late FGR lacks a “natural history” and may undergo rapid deterioration leading to severe injury or death without observable late-stage signs as in early FGR. In the last few years, predictors of poor outcome among mild-late forms of FGR have been investigated. In our study, the independent factor with the higher risk for an adverse outcome is the ACM, and the association of ACM < 5th centile with AtU > 95th centile. However, a large fraction of constitutionally and healthy SGA babies are unnecessarily induced. The management during pregnancy and the mode of delivery can be performed safely in the SGA fetuses at low risk and high risk population, if selected carefully.