Differences in fetal brain metabolism assessed by magnetic resonance spectroscopy in different clinical forms of late onset growth restriction

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Objective
We used magnetic resonance spectroscopy (MRS) to evaluate brain metabolic differences in frontal lobe and basal ganglia in small fetuses near term, classified as small for gestational age (SGA) or intrauterine growth restriction (IUGR), as compared to appropriate for gestational age (AGA) fetuses.

Methods
71 term small fetuses.

Results
Spectra obtained from frontal lobe showed that both SGA and late-onset IUGR fetuses had significantly reduced naa/cho levels when compared to AGA fetuses. This decrease followed a linear trend across the three clinical groups that were considered. No significant metabolic differences were found in basal ganglia.

Conclusion
Both SGA and late-onset IUGR showed differences in MRS brain metabolic ratios. These findings suggest that despite near-normal perinatal outcomes, SGA are not constitutionally small fetuses and may represent a form of growth disorder that requires to be clarified.