MR-spectroscopy as a potential prognostic tool in the assessment of white matter abnormalities in cytomegalovirus infections

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Objective
Cytomegalovirus (CMV) is the most frequent congenital viral infection. Primary contact during pregnancy may lead to intrauterine infection, which in turn can cause severe fetal CNS-damage. Brain involvement is the major cause of disability in these fetuses but good in-utero prognostic markers are still lacking. White matter signal abnormalities have been described in late gestations as markers of bad outcome (1). However, on prenatal MR images, white matter abnormalities are not always easy to discern from normal development and may be underestimated. This study aims to assess the use of MR-spectroscopy in CMV-infected fetuses and suspected white matter signal abnormalities, in the third trimester (2).

Methods
We present four cases (mean GA 32.5) of CMV-infected fetuses. The intrauterine involvement was confirmed by amniotic fluid testing. All cases presented with white matter signal changes suspicious for CMV-involvement. Spectroscopy was done using a short echo time (31 ms). Postnatal outcomes were assessed and correlated to these findings.

Results
Spectroscopy findings were able to predict outcomes in the four cases, as confirmed by postnatal neurology and MRI-assessment. Fetuses with normal spectrum or mild myo-inositol increase presented normal development. On the other hand, high lactate was associated with postnatal abnormalities.

Conclusion
MR-spectroscopy can be used as an add-on tool for the assessment of the fetal brain in doubtful cases, particularly in late gestational age. It might be a helpful prognostic tool in the prediction of infectious brain involvement, when the presence of white matter abnormalities cannot be otherwise excluded.