Effect of CMV infection on apparent diffusion coefficient (ADC) values of the fetal brain
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Objective
To evaluate the effects of CMV infection on apparent diffusion coefficient (ADC) values (an MR method) of the fetal brain in-utero.

Methods
Fifty-eight sequential fetal head MRI scans of proven CMV infected fetuses were retrospectively (2008-2010) analyzed and compared to a normal control group. Gestational age (GA) at the time of infection ranged from conception to 32 weeks of gestation, and fetal MRI scanning was performed at 24-38 weeks’ gestation. The frontal, parietal, temporal and occipital lobes (mainly white matter), basal ganglia (BG), thalamus, pons and cerebellum were analyzed by assessing ADC values. Two pregnancies were terminated and PM correlation was available. Regional ADC measurements were similarly obtained from 36 weeks A-matched uninfected fetuses.

Results
ADC values of the CMV infected fetuses are significantly and negatively correlated with GA in all brain regions except the basal ganglia. The cerebellum had the steepest decline (r=0. 52, p<0. 0001). Maternal age correlated positively with ADC in the frontal lobe (p<0. 05). Gestational age at infection and over pathological changes did not significantly affect ADC. ADC values of affected fetuses were significantly reduced in the frontal (p<0. 0001), parietal (p<0. 0001), occipital (p<0. 0005), and temporal (p<0. 001) lobes and thalamus (p<0. 006) compared to non-infected fetuses.

Conclusion
CMV infection of the fetal brain results in a highly significant, region-dependent reduction of ADC values in the frontal, parietal, occipital and temporal lobes and thalamus, probably reflecting hypercellularity and inclusion bodies in damaged areas. Reduction in ADC values may serve as a prognostic factor in CMV infected fetuses.