Background and Aims Pathogenesis of birth asphyxia has yet to be fully elucidated. To explore the mechanism of HR injury we followed the temporal profile of a priori selected genes in the newborn mouse brain.

Methods 84 C57BL/6 mice (postnatal day 7) were randomized to 120 minutes of hypoxia (FiO₂, 0.08, n=64) or 180 minutes in air (controls (C21), n=20). The hypoxia group was randomized to 30 minutes reoxygenation with FiO₂ 0.60 (H₆₀) or air (H₂₁). After observation in air for 0, 150, 300 minutes or 3 days, organs were harvested. Homogenate of hippocampus and striatum was analyzed for mRNA expression of 44 genes by real-time PCR.

Results Lcn3, Mtr, Hmxct and Vegfa were significantly up-regulated (p<0.05) after 0–300 min observation when comparing H₂₁ vs C₂₁ expression of 44 genes by real-time PCR.

Conclusions Genes important in inflammation (Lcn3, Mtr, Ccl2, Ccl12, Cxcl10, Tnf, Hmxct, Vegfa) and angiogenesis (Vegfa), and transcription regulation (Hmxct) were up-regulated from 0–150 min, Stat3 from 150–300 min, while Ccad was down-regulated at 0 min in both comparisons. In the H₁vsC₂₁ comparison at 0 min, Neil3 and Apy1f were down-regulated. When comparing H₆₀vsH₂₁, Cxcl10 (0 min) and Hmxct (300 min) were up-regulated while Neo13 (0 min) was down-regulated. There were no significant gene expression changes after 3 days.

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