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Maternal molecular hydrogen administration on lipopolysaccharide-induced mouse fetal brain injury

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Abstract

Fetal brain injury is often related to prenatal inflammation; however, there is a lack of effective therapy. Recently, molecular hydrogen (H₂), a specific antioxidant to hydroxyl radical and peroxynitrite, has been reported to have anti-inflammatory properties. The aim of this study was to investigate whether maternal H₂ administration could protect the fetal brain against inflammation. Pregnant C3H/HeN mice received an intraperitoneal injection of lipopolysaccharide (LPS) on gestational day 15.5 and were provided with H₂ water for 24 h prior to LPS injection. Pup brain samples were collected on gestational day 16.5, and the levels of apoptosis and oxidative damage were evaluated using immunohistochemistry. Interleukin-6 (IL-6) levels were examined using real-time PCR. The levels of apoptosis and oxidative damage, as well as the levels of IL-6 mRNA, increased significantly when the mother was injected with LPS than that in the control group. However, these levels were significantly reduced when H₂ was administered prior to the LPS-injection. Our results suggest that LPS-induced apoptosis, oxidative damage and inflammation in the fetal brain were ameliorated by maternal H₂ administration. Antenatal H₂ administration might protect the premature brain against maternal inflammation.

Keywords: anti-inflammation; anti-oxidant; brain injury; molecular hydrogen; premature infant.

Figures

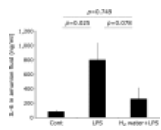


Fig. 1 IL-6 proteins in the amniotic...

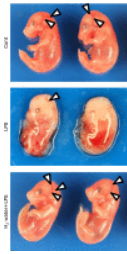


Fig. 2 The effect of H₂...

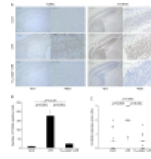


Fig. 3 (A) Representative data for TUNEL...

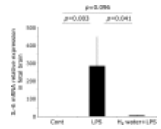


Fig. 4 IL-6 mRNA expression in the...

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