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Child neurodevelopmental outcomes following preterm and term birth: what can the placenta tell us?

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1 Abstract

2 A significant proportion of children born preterm will experience some level of
3 neurodevelopmental impairment. Changes in placental function have been observed
4 with many antenatal conditions that are risk factors for preterm birth and/or poor
5 neurodevelopment including fetal growth restriction and *in-utero* inflammation. This
6 review will highlight placental factors that have been studied to understand the
7 underlying mechanisms and identify biomarkers that lead to poor child
8 neurodevelopmental outcomes. These include changes in gross morphological and
9 histopathological structure and the placental inflammatory response to prenatal
10 infection. Further, we will describe the placenta's role as both a barrier to maternally-
11 derived bioactive substances critical for normal fetal brain development, such as
12 cortisol, and a source of neuroactive steroids and neurotrophins known to have critical

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