

Microstructural brain and multivoxel spectroscopy in very low birth weight infants related to insulin-like growth factor concentration and early growth

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Background: Very low birth weight (VLBW) children have higher risk of neurologic disabilities and growth factors are essential for brain maturation. **Aim:** To assess whether there are differences in neurologic findings, psychometric parameters and microstructural brain morphology in 1-year-old VLBW infants versus term healthy controls and whether these differences are related to hormonal/growth changes. **Methods:** Prospective anthropometry, prefeed venous blood sample [insulin, insulin-like growth factor-I (IGF-I), insulin-like growth factor-II (IGF-II), leptin, glucose], neurologic and imaging assessment, at age 1 year in 34 VLBW infants (12 SGA; 10 M) and 10 healthy term controls (5 M). **Results:** IGF-I concentrations at 1 month of corrected age were 20% lower in SGA versus appropriate for gestational age VLBW ($p < 0.02$). Gray and white matter volume and fractional anisotropy in 15/27 regions were decreased ($p < 0.001$). Abnormal spectroscopy was observed in 4 zones in VLBW versus term cont