

Neurodevelopmental outcome at 3 years of age in VLBW infants according to brain development and lesions

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Objective. Over the past decades severe brain lesions affecting very low birth weight (< 1500 g, VLBW) infants have been gradually substituted by milder lesions with debatable prognosis. The goal of our study was to define the type, frequency, and 3 years neurodevelopmental outcome of prematurity-related brain lesions in a modern cohort of VLBW infants.

Materials and Methods. VLBW infants admitted to our NICU in a 5-year period with brain MRI at term-equivalent age were included. MRI scans were reviewed to identify and grade white matter lesions (WML), intraventricular haemorrhage (IVH), and cerebellar haemorrhage (CBH). Linear measurements of brain size, biparietal width (BPW) and trans-cerebellar diameter (TCD), were performed. Total maturation score (TMS) was calculated. Developmental Coefficients (DQ) on Griffiths Scale at 3 years of age were

compared between patients with different types and grades of lesions and patients without lesions; possible correlations between linear brain measurements, brain maturation and outcome were explored.

Results. The study included 407 patients. Of these, 187 (46%) had at least one brain lesion on MRI, while 37 (9%) had severe lesions. The most frequent lesion was IVH (28%), followed by WML (21%) and CBH (17%). Mild and severe IVH, moderate and severe WML and all grades of CBH were related to worse outcome at 3 years. In patients without lesions, small BPW and small TCD were associated with worse outcome. No correlations were observed between TMS and outcome.

Conclusions. We have observed that even mild brain lesions have a negative influence on neurological outcome at 3 years of age.