

Long-Term Consequences of Very Preterm Birth or Very Low Birth Weight: Mapping Brain Networks for Cognitive Control

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Very preterm birth (VPT; <32 weeks' gestation) or very low birth weight (VLBW; <1500 g) often leads to reduced cognitive control, changes in the brain network topology of the cognitive control circuitry, and an increased risk of attention deficit hyperactivity disorder. While this has been extensively studied in children, the persistence of these challenges into adulthood is less clear. In this study, we investigated the long-term effects of VPT/VLBW birth on cognitive control in adults aged 26 years. Using a multimodal approach, we analysed a subset of data from the Bavarian Longitudinal Study, including 67 VPT/VLBW and 81 full-term (FT) individuals. We derived a latent variable of cognitive control and compared it between VPT/VLBW and FT adults. In addition, we investigated the structural brain network topology of the cognitive control system using graph theoretical parameters. Findings in line with our predictions include reduced cognitive control in VPT/VLBW adults, along with changes in network topology characterised by increased segregation and reduced node centrality. We also examined the predictive power of network topology on cognitive control, but found no associations. Results will be discussed in the context of the long-term consequences of preterm birth.