

Prenatal head growth and child neuropsychological development at age 14 months

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Objective

We sought to assess the association between prenatal head growth and child neuropsychological development in the general population.

Study Design

We evaluated 2104 children at the age of 14 months from a population-based birth cohort in Spain. Head circumference (HC) was measured by ultrasound examinations at weeks 12, 20, and 34 of gestation and by a nurse at birth. Head growth was assessed using conditional SD scores between weeks 12-20 and 20-34. Trained psychologists assessed neuropsychological functioning using the Bayley Scales of Infant Development. Head size measurements at birth were transformed into a 3-category variable: microcephalic (<10th percentile), normocephalic (\geq 10th and <90th percentile), and macrocephalic (\geq 90th percentile) based on the cohort distribution. *P* values < .05 were considered statistically significant.

Results

No overall associations were observed between HC or head growth and mental and psychomotor scores. In particular, no associations were found between HC at birth and mental scores (coefficient, 0.04; 95% confidence interval, -0.02 to 0.09) and between interval head growth (20-34 weeks) and mental scores (0.31; 95% confidence interval, -0.36 to 0.99). Upon stratification by microcephalic, normocephalic, or macrocephalic head size, results were imprecise, although there were some significant associations in the microcephalic and macrocephalic groups. Adjustment by various child and maternal cofactors did not affect results. The minimum sample size required for present study was 883 patients ($\beta = 2$, $\alpha = 0.05$, power = 0.80).

Conclusion

Overall prenatal and perinatal HC was not associated with 14-month-old neuropsychological development. Findings suggest HC growth during uterine life among healthy infants may not be an important marker of early-life neurodevelopment but may be marginally useful with specific populations.