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EARLY BRAIN CONNECTIVITY DIFFERENCES IN PREMATURE INFANTS

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Introduction

Brain maturation at early stages may be assessed by changes in electroencephalographic connectivity (Grieve et al., 2008).

Aim

To determine differences in brain maturation between infants born at different gestational age by comparing connectivity measures obtained at comparable post-conceptional age.

Methods

Electroencephalogram was recorded on twenty-six infants (23–35 weeks) at 35 post-conceptional weeks. Infants were divided in groups according to gestational age: 23-27 (ELGA), 28–32 (VLGA) and 34–35 (LGA) weeks. Data were recorded on Fp1, Fp2, Fz, C3, Cz, C4, T3, T4, O1 and O2 channels referred to linked mastoids and transformed into the frequency domain using a Fast Fourier Transformation algorithm. A single-subject-connectivity-matrix approach was used to obtain measures of global/local connectivity (clustering coefficients, strength and modularity) in delta (0.5-4Hz), theta (4-8Hz), alpha (8-13Hz) and beta (13-30Hz) bands. Functional connectivity measures were compared between subgroups.

Results

A greater mean coherence strength of the theta band of the right hemisphere in LGA compared with ELGA ($p = .006$) were found.

Conclusion

The comparison at the same post-conceptional age of infants born at different gestational weeks allowed to emerge early differences in brain electrical activity suggesting altered developmental trajectories for premature infants born at lower gestational ages.