Low maternal vitamin B12 status during pregnancy is associated with reduced heart rate variability indices in young children.

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BACKGROUND: Vitamin B12 plays a vital role in neuronal development, particularly in myelinogenesis. Demyelination of the autonomic nervous system occurs early in vitamin B12 deficiency. However, the impact of maternal vitamin B12 deficiency during pregnancy on neuronal function in the offspring is poorly documented.

OBJECTIVE: The objective of this study was to assess cardiac autonomic nervous activity in children born to mothers with low vitamin B12 status during pregnancy using heart rate variability (HRV) indices in the frequency domain.

METHODS: Seventy-nine healthy children between 3 and 8 years of age were evaluated from an ongoing birth cohort. The blood sample of the mother had been stored and was analysed for plasma vitamin B12 following enrolment of the child. Subjects were divided, based on the median maternal first trimester vitamin B12 status (114 pmol L(-1) ), into lower (n=40) and higher (n=39) vitamin B12 status groups. A lead II electrocardiogram was recorded in the supine posture and subjected to HRV analysis.

RESULTS: Low-frequency HRV in absolute units was reduced significantly in children of the lower vitamin B12 status group (P=0.03) and was 53% that of the higher vitamin B12 status group. There was a significant association between low-frequency and total power HRV with cord blood vitamin B12 levels (ρ=0.31 and 0.30, both P=0.03).

CONCLUSION: In summary, children born to mothers with a lower vitamin B12 status have a reduced cardiac sympathetic activity. The long-term implication of this needs to be evaluated by follow-up studies.

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