Maternal Prenatal Vitamin B12 Intake and Child Cognitive Development

Eliska Hrezova, Gabriela Ksinan Jiskrova, Tomas Prusa, Hynek Pikhart

BACKGROUND

Nutrient deficiencies in diet during pregnancy may have an adverse effect on the development of offspring.
Vitamin B12 has an important role in the growth and development of the fetal brain.
The association between prenatal vitamin B12 intake and cognitive functioning in children is unclear.

OBJECTIVE

Analyze the association between maternal pregnancy vitamin B12 intake and the cognitive outcomes of children.

METHODS

- Population-based prospective longitudinal birth cohort study ELSPAC.
- Pregnant women enrolled in 1991-92 in Brno and Znojmo.
- Dietary data measured using food frequency questionnaire.
- Speech and language development reported at 18 months, 3, 5, and 7 years of the child´s age.
- Single scores for vocabulary, language, early communication, understanding, and intelligibility were calculated.
- **Higher scores indicate better speech and language development.**
- Intelligence Quotient (IQ) was measured at the individual examination of children at 8 years.
- Data were analyzed using multiple linear and logistic regression models.

RESULTS

In fully adjusted models, higher prenatal vitamin B12 intake was positively associated with:

- Higher speech and language test scores at 18 months and 3 years.
- Higher IQ in subtests and full-scale at 8 years.
- No assocatios found at 5 and 7 years.

TEST (18 month)	n	beta (CI 95%)
Vocabulary	2,882	0.046 (0.27; 2.61)
Language	2,898	0.042 (0.01; 0.25)
Early communication	2,871	0.048 (0.02; 0.17)
Understanding	2,879	0.050 (0.01; 0.09)

TEST	n	OR (CI 95%)
3-year intelligibility	2,976	1.07 (1.01; 1.14)

TEST (8 years)	n	beta (CI 95%)
IQ verbal	672	0.097 (0.31; 1.75)
IQ perform	672	0.082 (0.13; 1.66)
IQ total	670	0.086 (0.19; 1.60)

Beta is the effect size on outcome per unit change in maternal vitamin B12 intake.
OR is the likelihood to get maximum points in the intelligibility test opposed to children of mothers with lower B12 intake.

CONCLUSION

We found consistent and significant associations between prenatal vitamin B12 intake and child cognitive development.
The results suggest that a diet during pregnancy low in vitamin B12 may negatively affect children's cognitive development, particularly in speech and language, and IQ.
A healthy pregnancy diet with sufficient vitamin B12 should be promoted.

Contact: Eliska.hrezova@recetox.muni.cz
RECETOX, Faculty of Science, Masaryk University

MUNI | RECETOX