IGF-I AT 4 MONTHS ASSOCIATES TO VISCERAL AND SUBCUTANEOUS ADIPOSE TISSUE AT 7 YEARS OF AGE

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- **EARLY NUTRITION HAS IMPACT ON IGF-I**
- **IGF-I AT 4 MONTHS OF AGE IS ASSOCIATED TO VISCERAL AND SUBCUTANEOUS FAT AT 7 YEARS OF AGE**

Objective:

Insulin-like growth factor I (IGF-I) regulates fetal and infant growth and is influenced by nutrition during infancy. Breast fed children have lower IGF-I levels than formula fed infants and the reason is partly explained by lower levels of protein and higher level of polyunsaturated fatty acids (PUFA) in breast milk compared to formula.

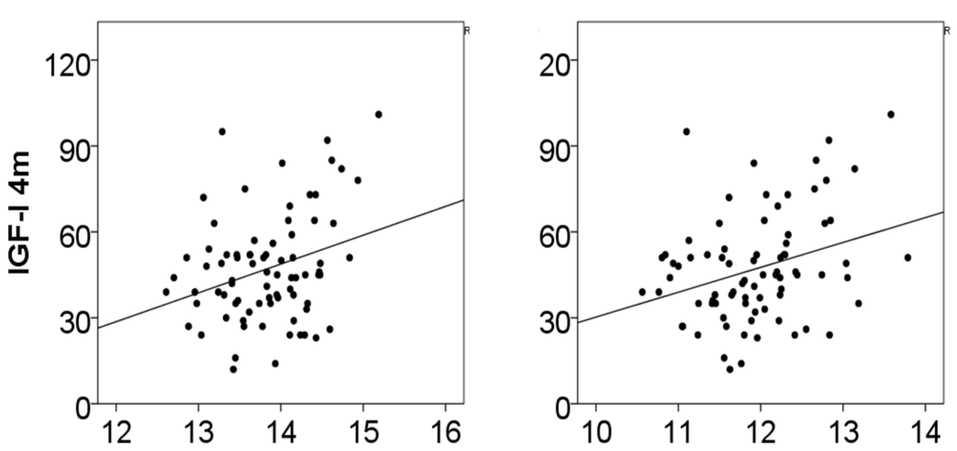
Environmental factors, such as nutrition, have long-lasting influences on hormone secretion and on future metabolic health. Intraabdominal adipose tissue (VAT) is known to be associated with metabolic risk factors.

The best method for measuring VAT is Magnetic Resonance Imaging (MRI).

Aim:

The aim of this study was to investigate IGF-I at 4 months of age and the association to composition of VAT and subcutaneous adipose tissue (SAT) in children at seven years of age.

Figure 1:



IGF-I correlates to SAT and VAT here shown in logaritmic scale due to non-normal distribution. IGF-I is in µg/L.

Abbreviations: IGF-I, insulin-like growth factor I; SAT, subcutaneous abdominal fat; VAT, visceral abdominal fat

Method:

81 children (39 boys, 42 girls) who participated in an ongoing Swedish birth cohort, Halland Health and Growth Study (H^2G Study) were included. In this study. The children have been followed regularly since birth with anthropometry and blood sampling. At 7 years of age MRI was performed for quantifying VAT and SAT. On the day of MRI the children had a fat free breakfast.

Results:

Girls had larger volumes of SAT than boys (1,25 L versus 0.83 L, p = 0.02), but there were no differences in amount of VAT (0.17 L versus 0.13 L, p = 0.07) at 7 years of age. There were no gender differences in IGF-I concentration in girls and boys at 4 months of age (p = 0.39).

IGF-I at 4 months of age correlated to both VAT (r = 0.35, p = 0.002) and SAT (r = 0.35, p <0.001) at 7 years of age (Figure 1). In a stepwise adjusted model, IGF-I at 4 months of age accounted for 11% of the variation of VAT at 7 years of age. Likewise, IGF-I at 4 months of age accounted for 9% of the variation of SAT at 7 years of age (Table 1).

Conclusion:

IGF-I at 4 months of age predicts VAT and SAT at 7 years of age. This indicates that early programming during the first months of life with growth factors, independently of weight, can influence body composition and possibly cardiometabolic risk later in life. This would highlight the early nutritions importance for growth and later health.

Table 1: Adjusted regression models explaining VAT and SAT at 7 years of age

	β	R^2	p-value	p-values for explanatory variables Sex/GA/W4m/$BMI_{maternal}$
Independent variable VAT				
IGF-I 4m	0.35	0.37	0.001	– / – / 0.005 / <0.001
Independent variable SAT				
IGF-I 4m	0.33	0.32	0.004	0.02 /– / – / 0.001

Multiple regression mdel. Beta and R2 are adjusted values.

Abbreviations: GA, gestational age; W4m. weight, at 4 months; BMI, body mass index; VAT, visceral adipose tissue, SAT, subcutaneous adipose tissue

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