



What are early predictors of impaired glucose tolerance in children born SGA?

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Background

Subjects born small for gestational age (SGA) were shown to be at higher risk to later metabolic consequences but early prediction factors of changes in glucose metabolism are not clearly known.

Objective and hypotheses

We aimed to investigate glucose tolerance and insulin resistance in adolescents born SGA or appropriate for gestational age (AGA) and their relationship with perinatal and postnatal factors.

Method

A prospective cohort of 48 SGA and 98 AGA children was followed-up from birth to adolescence (75 boys, 71 girls). At the time of study subjects were 11-15 years old (mean 13.1±1.4; SGA 12.3±1.1; AGA 13.5±1.4 yrs, p=0,001). 14.6% of SGA children did not show catch-up growth.

All children were asked to fast over night. Oral glucose tolerance test (OGTT) was performed and blood glucose and insulin were measured in fasting, 30 min. and 120 min. after glucose load.

Statistical analyses were adjusted for sex, age, pubertal stage and BMI SDS.

Results

SGA children without catch-up had higher 30 and 120 min. post-load glucose concentration than those with catch-up growth or AGA (Figure 1).

The differences in insulin levels and HOMA-IR were not significant between groups.

Higher 120 min. post-load glucose concentration was related with smaller size at birth and faster prepubertal BMI growth rate (Figure 2 a, b, c, d).

Fasting insulin and HOMA-IR correlated directly with height growth velocity during first month after birth (r=0.252, p=0.018; r=0.237, p=0.027), height and weight gain during first 6 years of life (r=0.419, p=0.021; r=0.408, p=0.025).

Figure 2. Correlations between 120 min. post-load glucose level and perinatal and postnatal factors

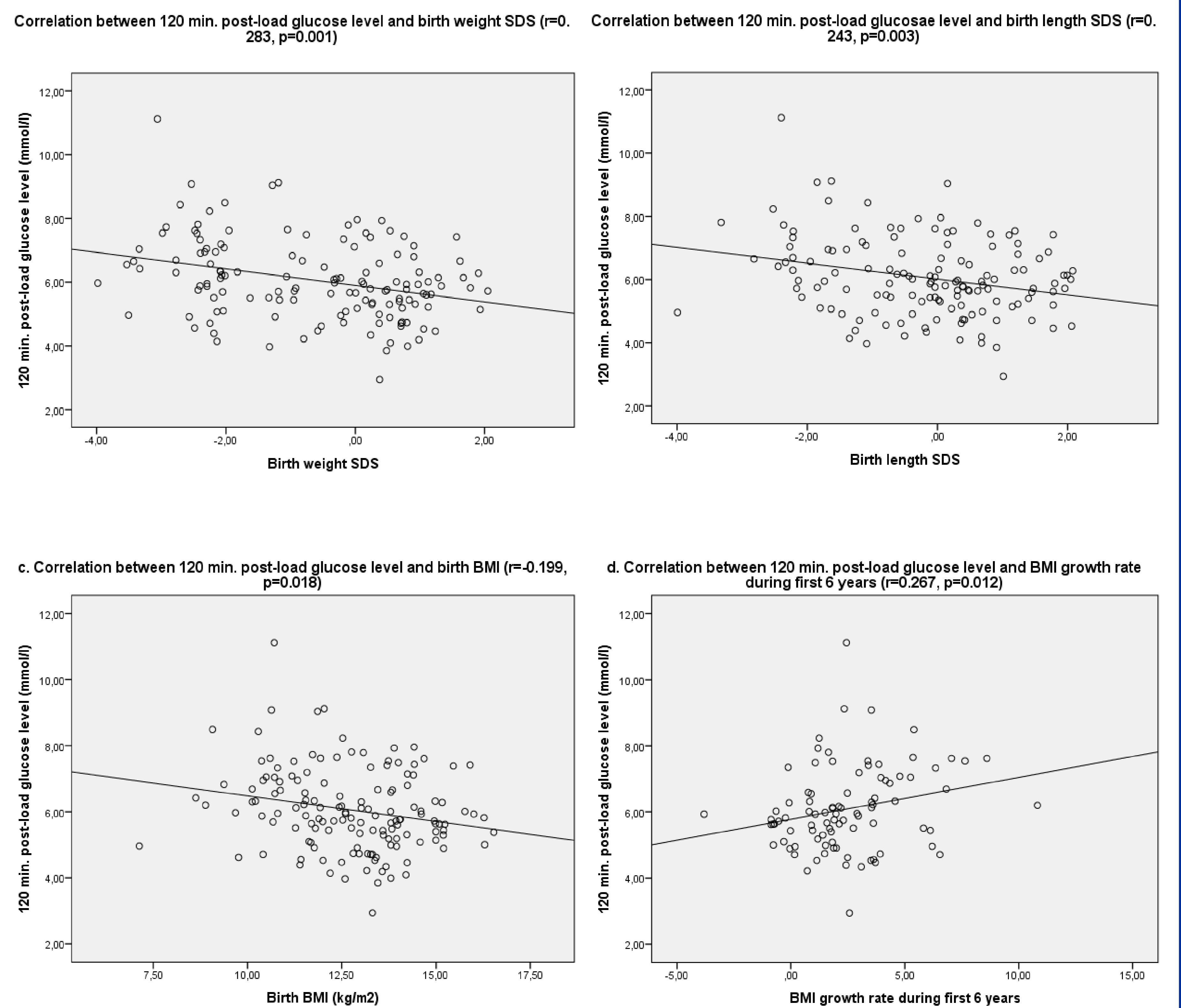
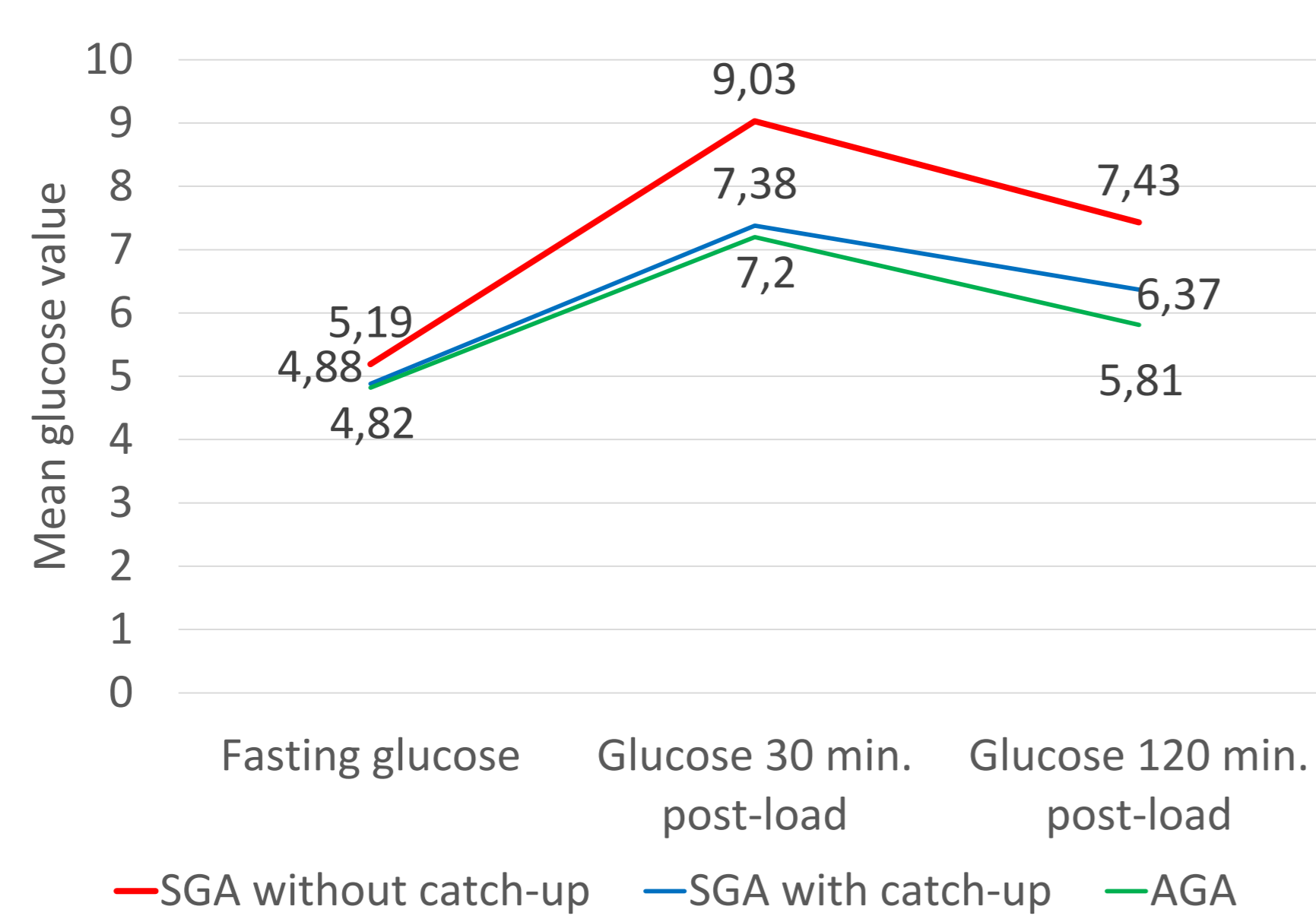


Figure 1. Mean glucose levels in study children during OGTT



Conclusion

Smaller size at birth, higher prepubertal BMI gain and absence of postnatal catch-up growth are related to higher post-load glucose levels in puberty.

Aknowlegements

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