

Glycemic properties of maternal diet in relation to preterm delivery and abnormal birth weight

Akademisk avhandling

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Linda Englund Ögge

Fakultetsopponent:

Professor Irene Cetin

Department of Biomedical and Clinical
Science, University of Milano, Milano,
Italien

This thesis is based on the following papers:

- I. Englund-Ögge L, Brantsæter AL, Haugen M, Sengpiel V, Khatibi A, Myhre R, Myking S, Meltzer HM, Kacerovsky M, Nilsen RM, Jacobsson B. Association between intake of artificially sweetened and sugar-sweetened beverages and preterm delivery: a large prospective cohort study. *Am J Clin Nutr.* 2012 Sep;96(3):552-9.
- II. Englund-Ögge L, Brantsæter AL, Sengpiel V, Haugen M, Birgisdottir BE, Myhre R, Meltzer HM, Jacobsson B. Maternal dietary patterns and preterm delivery: results from large prospective cohort study. *BMJ.* 2014 Mar4;348:g1446.
- III. Englund-Ögge L, Birgisdottir BE, Sengpiel V, Brantsæter AL, Haugen M, Myhre R, Meltzer HM, Jacobsson B. Meal frequency patterns and glycemic properties of maternal diet in relation to preterm delivery: Results from a large prospective cohort study. *PLoS One.* 2017 Mar 1;12(3):e0172896.
- IV. Englund-Ögge L, Brantsæter AL, Haugen M, Meltzer HM, Jacobsson B, Sengpiel V. Maternal dietary patterns and associations of having a small-for-gestational-age or a large-for-gestational-age baby in the Norwegian Mother and Child Cohort Study. Manuscript.

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ABSTRACT

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Linda Englund Ögge

Institute of Clinical Sciences at Sahlgrenska Academy, University of Gothenburg,
Gothenburg, Sweden, 2017

Aims: To examine whether glycemic aspects of maternal diet, affects the risk of preterm delivery or of having a small for gestational age (SGA) or large for gestational age (LGA) baby.

Subjects and methods: The studies included pregnant women from the Norwegian Mother and Child Cohort Study (MoBa). Study I included 60,761, Study II and Study III (part II) 66,000, Study III (part I) 65,487 and Study IV included 65,904 women. Information about maternal diet was collected in mid-pregnancy with a self-reported, validated food frequency questionnaire. Data on covariates were obtained from responses to two questionnaires during pregnancy. Information on gestational length and birth weight was obtained from the Medical Birth Registry of Norway. Binary logistic regression, Spearman's correlation coefficient and factor analysis were used to analyze data. Unadjusted and adjusted analyses were performed.

Results: Paper I: More than one daily serving of sugar-sweetened beverages was associated with a 25% increased risk of preterm delivery, the same intake of artificially sweetened beverages was associated with an 11% increased risk, compared to non-intake. **Paper II:** High intake of a "prudent" dietary pattern was associated with an 11% lower risk of preterm delivery, compared to low intake. A high prudent intake was associated with lower risk of both late and spontaneous preterm delivery. No independent association was found for the "Western" dietary pattern. High adherence to the "traditional" dietary pattern was related to a 9% reduced risk. **Paper III:** High adherence to a "main meal" frequency pattern was associated with an 11% reduction in preterm delivery risk, as well as reduced risks of late preterm delivery and of preterm delivery in overweight women. No associations were found between preterm delivery and glycemic load, glycemic index, carbohydrates, added sugar or dietary fiber. **Paper IV:** The "high prudent" diet was associated with increased risk of SGA and decreased risk of LGA. The "high traditional" diet was associated with increased LGA risk.

Conclusions: Maternal diet may be an important risk factor for preterm delivery. Food quality may be relevant for SGA and LGA risks. The role of maternal diet in adverse pregnancy outcomes requires further study.

Keywords: *Preterm delivery, SGA, LGA, sugar-/artificially sweetened drinks, dietary patterns, meal frequency, glycemic index, glycemic load, carbohydrates, sugar, dietary fiber.*

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Gothenburg 2017, linda.englund-ogge@vgregion.se