**A survival analysis approach to assess the association between maternal pre-pregnancy overweight and childhood overweight – Results of the Ulm Birth Cohort Study (UBCS)**

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**Conclusion**

These results suggest that maternal prepregnancy overweight is a significant factor in the association between fetal environment and post-delivery development of overweight in their offspring. These findings may be explained by genetic imprinting and/or intrauterine programming of offspring's endocrine and metabolic system by the mother.

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**Introduction**

It is believed that the fetal and early postnatal environment has a significant impact on the development of overweight of a child in later life (early life programming of long-life diseases). Maternal pre-pregnancy BMI values determine the fetal environment.

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**Aim**

It has been suggested that maternal prepregnancy overweight increases the risk of an child of becoming overweight in childhood. We aimed to use a survival analysis approach to investigate this hypothesis in the prospective Ulm Birth Cohort Study (UBCS).

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**Methods**

**Ulm Birth Cohort Study (UBCS)**

1. Recruitment of the study participants
   - Recruiting period: November 2000 - November 2001
   - Place: Gynaecology and Obstetrics Unit, University of Ulm, Germany
   - Inclusion criteria: children with a birth weight >2000g, pregnancy duration of at least 32 weeks (n=1.086 mothers and their newborns)

2. Study design
   - Baseline examination:
     - Maternal prepregnancy BMI values have been obtained from maternal record of prenatal care [normal weight: BMI=24.9 kg/m²; overweight: BMI>25.0 kg/m²]
     - Parent questionnaire at baseline: maternal age at child’s birth [years], maternal smoking habits during pregnancy [no vs yes], maternal school education [school years], maternal migration background [yes vs no], maternal intention to breastfeed the child [yes vs no], number of parity, gender of the child [male vs. female], week of gestation [weeks]
     - Follow-up examinations (birth up to age of 6 years): weight and height values of the children were obtained at each follow-up examination (parent questionnaire, measured by paediatricians at German regular health examinations “U Untersuchung”)
     - Definition of overweight at each follow-up examination: >90th age- and sex-specific percentiles of the German reference data [Kromeyer-Hauschild et al., 2001]

3. Statistics
   - Study sample: children and mothers with complete baseline covariates (n=1.026)
   - Survival analysis: Kaplan-Meier method

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**Results**

*Figure 1. Comparison of the survival functions of children of pre-pregnancy normal weight mothers (continuous line) and of children of pre-pregnancy overweight mothers (dotted line)*

<table>
<thead>
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<th>Table 1. Crude and adjusted Cox proportional hazard regression model</th>
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<tbody>
<tr>
<td>HR</td>
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<td>Maternal pre-pregnancy normal weight [Ref]</td>
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<td>Maternal pre-pregnancy overweight</td>
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*adjusted for: maternal age at child’s birth [years], maternal smoking habits during pregnancy [no vs yes], maternal SES (low vs middle vs high), maternal migration background [yes vs no], maternal intention to breastfeed the child [yes vs no], number of parity, gender of the child [male vs female], week of gestation [weeks]*

- 32.2% of the children became overweight within study period (0 to 6 years)
- Offsprings of pre-pregnancy overweight mothers had a 46% higher risk of becoming overweight in childhood than offsprings of pre-pregnancy normal weight mothers [HR: 1.46 (1.22-1.68)]
- After adjusting for covariates, this association remained still significant [HR: 1.35 (1.08-1.56)]

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The authors have nothing to disclose.

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