

Higher free testosterone in third trimester was associated with lower abdominal circumference at birth in boys: Odense Child Cohort.

Camilla Palm¹, Anja Dreyer¹, Henriette Boye¹, Jan Stener Joergensen², Chunsen Wu³, Frederik Højsager¹, Tina Kold Jensen¹, Dorte Glintborg¹, and Marianne Andersen¹

¹Odense University Hospital

²University of Southern Denmark Faculty of Health Sciences

³University of Southern Denmark

March 10, 2023

Abstract

Objective: To investigate programming effects of maternal testosterone on offspring birth anthropometrics. **Design:** Population-based prospective cohort study. **Setting:** University Hospital. **Population:** 1,486 mother-child dyads from Odense Child Cohort. **Methods:** Maternal blood samples were collected at gestational week 27-30 and free testosterone (FT) levels were calculated using the Vermeulen equation from total testosterone (TT) analyzed by mass spectrometry and sex hormone binding globulin (SHBG). Associations between FT or TT levels and birth anthropometrics were analyzed with multiple linear regression models according to offspring sex with adjustment for maternal age, parity, smoking and educational level. Analyses were repeated with polycystic ovary syndrome (PCOS) as exposure for offspring birth anthropometrics. **Main outcome measures:** Offspring birth weight (BW), birth length, abdominal- and head circumferences. **Results:** Maternal mean (SD) age was 30.2 (4.5) years and pre-pregnancy body mass index (BMI) was 23.5 (5.3) kg/m². In boys (n=787), higher FT was associated with lower BW (adjusted doubling constant=-65.53, p=0.010), shorter birth length (adjusted doubling constant=-0.43, p<0.001), and lower abdominal circumference (adjusted doubling constant=-0.39, p<0.001); Higher TT was associated with lower abdominal circumference (adjusted doubling constant=-0.25, p=0.028). In girls, no associations were found between maternal FT or TT and offspring anthropometrics. **Conclusions:** Higher maternal free testosterone exposure was linked to reduced birth weight, length and abdominal circumference in boys, whereas girls were not susceptible to maternal testosterone exposure.

Hosted file

Manuscript_BJOG.docx available at <https://authorea.com/users/594471/articles/628921-higher-free-testosterone-in-third-trimester-was-associated-with-lower-abdominal-circumference-at-birth-in-boys-odense-child-cohort>

Hosted file

Figure_BJOG.docx available at <https://authorea.com/users/594471/articles/628921-higher-free-testosterone-in-third-trimester-was-associated-with-lower-abdominal-circumference-at-birth-in-boys-odense-child-cohort>

Hosted file

Table 1_BJOG.docx available at <https://authorea.com/users/594471/articles/628921-higher-free-testosterone-in-third-trimester-was-associated-with-lower-abdominal-circumference-at-birth-in-boys-odense-child-cohort>

Hosted file

Table 2_BJOG.docx available at <https://authorea.com/users/594471/articles/628921-higher-free-testosterone-in-third-trimester-was-associated-with-lower-abdominal-circumference-at-birth-in-boys-odense-child-cohort>

Hosted file

Table 3_BJOG.docx available at <https://authorea.com/users/594471/articles/628921-higher-free-testosterone-in-third-trimester-was-associated-with-lower-abdominal-circumference-at-birth-in-boys-odense-child-cohort>

Hosted file

Supplementary tables and figures_BJOG.docx available at <https://authorea.com/users/594471/articles/628921-higher-free-testosterone-in-third-trimester-was-associated-with-lower-abdominal-circumference-at-birth-in-boys-odense-child-cohort>