The influence of fetal sex on patterns of change in anti-Mullerian hormone during pregnancy

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Introduction

Maternal anti-mullerian hormone declines sharply between 13-15 weeks, likely as a result of feto-placental signaling. Fetal AMH levels are known to be widely disparate after the first trimester, with high levels in male and absent levels in female. However, it is unclear as to whether differing fetal AMH levels influence the pattern of change of maternal AMH. Our objective was to examine AMH throughout gestation to determine if the maternal concentration varies according to the gender of the fetus.

Methods

De-identified maternal plasma samples along with demographic and pregnancy outcome data were obtained from the IRB-approved Maternal-Fetal Tissue Bank at the University of Iowa. All women were ≥18 years old and had an uncomplicated singleton delivery at ≥37 weeks. AMH was tested using the GenII AMH ELISA assay (Beckman Coulter). Bicinchoninic acid (BCA) assay (Pierce) was used to measure total protein. AMH was normalized to total protein prior to analysis. Mean AMH and AMH by gestational age between women carrying boys vs. girls was compared with logistic regression modeling.

Results

154 samples from 107 women (51 males and 56 females) were analyzed. Because of multiple sampling, 78 samples were from boys and 76 samples were from girls. No differences in maternal age, gestational age at delivery, or number of samples from
each gestational category between sexes. Mean AMH levels were not different if carrying a male vs. female fetus (p=0.12). However, when stratified by gestational age, mean AMH (±SEM) at 11-15 weeks was significantly higher in women with male fetuses (2.0±0.30ng/mL) vs. female fetuses (0.94±0.20ng/mL) (p=0.008).

**Conclusion**

AMH falls in pregnancy between 11-15 weeks regardless of fetal sex; however, maternal AMH is significantly higher in pregnancies carrying male compared to female fetuses. This may represent a sexually dimorphic response in the ovary to feto-placental signaling.