34 ONE-CARBON METABOLISM GENES AND UTEROPLACENTAL INSUFFICIENCY (UPI) DENISE FURNESS[1], MICHAEL FENECH[2], GUSTAAF DEKKER[1], [1]Adelaide University, Obstetrics and Gynaecology, Adelaide, South Australia, Australia, [2]CSIRO, Human Nutrition, Adelaide, South Australia, Australia

OBJECTIVE: The purpose of this study was to test five genetic polymorphisms involved in one- carbon metabolism for a potential association with increased risk of developing UPI.

STUDY DESIGN: This was a prospective observational study. DNA was obtained from 139 mothers and 124 placentas. Maternal and placental DNA samples were genotyped for MTHFR C677T and A1298C, MTR A2756G, MTRR A66G, MTHFD1 G1958A polymorphisms using Real Time PCR. UPI was defined as pre-eclampsia (PE), gestational hypertension, intrauterine growth restriction (IUGR) <10th centile or placental abruption. Chi-squared analysis was performed to compare allele proportion and genotype frequencies with UPI. The Hardy-Weinberg equilibrium equation was performed for all genotype data. The association between maternal and fetal single nucleotide polymorphisms (SNPs) with plasma homocysteine (Hcy) was determined using one-way ANOVA. Linear regression was used to test the effects of confounding factors including B-vitamin supplement intake and smoking.

RESULTS: Genotype frequencies for all the tested SNPs were calculated and found to fit the Hardy-Weinberg equilibrium equation. The results show that the maternal MTHFD1 1958 AA genotype is associated with IUGR ($P = 0.047$). Moreover, the placental MTR 2756 GG genotype was significantly associated with increased plasma Hcy ($P = 0.017$) and the development of UPI ($P = 0.022$).

CONCLUSION: Our study highlights two novel polymorphisms MTHFD1 G1958A and MTR A2756G in relation to the development of UPI. The MTHFD1 enzyme catalyses the conversion of one-carbon derivatives of tetrahydrofolate, which are substrates for methionine, thymidylate and de novo purine synthesis. In addition the second finding associates MTR with increased maternal plasma Hcy and the development of UPI. MTR catalyses the methylation of Hcy to methionine. Formation of methionine through this pathway represents an important component for synthesis of phospholipids, proteins, myelin, DNA, RNA and S-adenosyl methionine, which are all important in placental and fetal development.

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35 MEDICATION EFFECTS ON MATERNAL SERUM SCREENING DAWN PEKAREK[1], VICTORIA CHAPMAN[1], CHERRY NEELY[1], JOSEPH BIGGIO[1], [1]Center for Women's Reproductive Health, University of Alabama at Birmingham, Obstetrics and Gynecology, Birmingham, Alabama

OBJECTIVE: Maternal ethnicity and diabetes affect the concentration of maternal serum analytes in aneuploidy screening, but little is known about the effect of medications on analyte concentrations. Since medications can alter the activity of metabolic enzymes, we sought to determine whether certain drug classes are associated with alterations in concentrations of "Quad screen" analytes or the overall screen-positive rate.

STUDY DESIGN: IRB-approved, retrospective cohort of singleton gestations with a Quad screen performed in our laboratory 12/04-6/07. Information on medications (by class) taken at time of Quad screen was abstracted from our computerized prenatal database. Mean multiples of the median (MoM) for each analyte (after routine adjustment for weight and ethnicity) and the overall screening result were abstracted from the laboratory database and compared between the exposed (those taking the class of agent) and controls (those not taking that class of agent).

RESULTS: 6,482 women were included. AFP mean MoM was higher in women taking immunosuppressants compared to controls (1.4 vs 1.1, $p=0.02$) and these women more frequently were screen positive for NTDs (12.8 vs 1.6%, $p<0.0001$). Methadone and immunosuppressants were associated with lower mean estriol MoM (0.9 vs 1.1, $p=0.04$). Mean hCG levels were lower in women taking methadone (0.8 vs 1.1, $p=0.005$), but higher with anti-emetics (1.1 vs 1.0, $p=0.009$). Mean inhibin A MoM was increased in women on drugs for asthma, epilepsy, hypertension, and depression (all $p<0.02$). Women taking anti-depressants and anti-epileptics were more likely to have a positive screen for trisomy 21 than controls (6.7 vs 3.9%, $p=0.04$; 9.7 vs 3.9%, $p=0.02$, respectively).

CONCLUSION: Various drug classes affect the 4 analytes used for Quad screening and the screen-positive rate. Whether adjustment of results based on medication usage improves screening performance warrants further investigation.

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