GENERAL

Abstracts 36 – 43

Moderators: Thomas Garite, MD; Mary D'Alton, MD; Vincenzo Berghella, MD

36 Effect of in utero alcohol exposure on the expression of antioxidant enzymes in a mouse model of fetal alcohol syndrome

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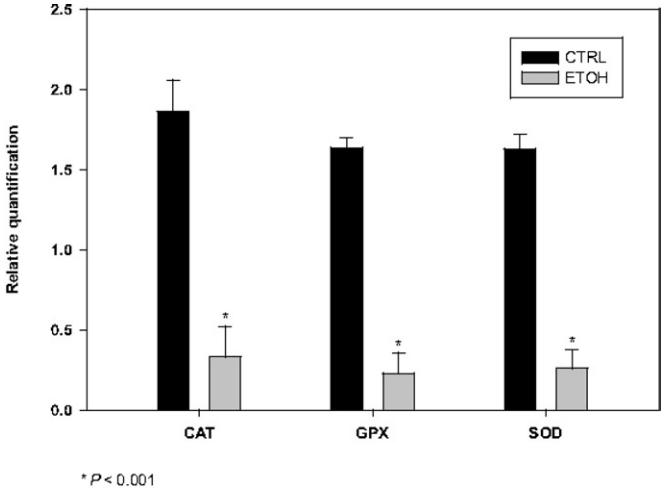
OBJECTIVE: Fetal alcohol syndrome (FAS) is the most common non genetic cause of mental retardation. Oxygen consumption in the brain results in generation of free radicals and this effect is magnified in response to alcohol. Antioxidative enzymes like superoxide dismutase (SOD), glutathione peroxidase (GPx) and catalase (CAT) function to prevent the cellular damage produced by free radicals. Our objective was to evaluate the effect of prenatal alcohol on antioxidant enzyme expression.

STUDY DESIGN: A well-characterized FAS model was used (Webster, 1980). Timed, pregnant C57BL6/J mice were treated on gestational day 8 (E8) with intraperitoneal injection of saline (control) or alcohol (0.03 mL/g). Pups were harvested on gestational day 18 (E18), their brains extracted and homogenized. Each fetal brain was analyzed individually for mRNA expression of SOD, GPx and CAT using real-time PCR with 18S for internal control. Student t test was used for statistical analysis (significance: $p<0.05$).

RESULTS: 25 pups from 4 litters in the alcohol group and 23 pups from 5 litters in the saline group were analyzed. There was no difference in maternal or pup weight between the two groups. SOD, GPx and CAT mRNA expression was significantly lower in the alcohol group compared to controls (Figure, $p<0.001$).

CONCLUSIONS: Prenatal alcohol exposure inhibits SOD, GPx and CAT expression. The reduction in these antioxidant enzymes promotes an oxidant environment and contributes to the cytotoxicity associated with FAS. The antioxidant system may be a novel pathway to target for prevention of the long term morbidity of FAS.



37 Maternal 25(OH)D levels and sFLT-1/PlGF ratio improves predictability of severe preeclampsia in early pregnancy

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OBJECTIVE: Preeclampsia is a major cause of maternal and perinatal morbidity and mortality. It remains uncertain whether altered angiogenic factor activity in patients with preeclampsia is a result of the current disease state or if it was present before the development of preeclampsia. Recent studies have shown that low serum 25-hydroxyvitamin D (25[OH]D) level is a risk factor for preeclampsia. The clinical significance of in vitro findings that vitamin D regulates vascular endothelial growth factor (VEGF) production is unclear. We sought to determine if there is an association between second trimester maternal serum 25(OH)D levels and angiogenic factor activity and to compare their predictability of preeclampsia.

STUDY DESIGN: We conducted a nested case-control study of pregnant women with severe preeclampsia ($n=41$) versus women with uncomplicated term birth ($n=123$) who delivered at UNC Women's Hospital between January 2000 and February 2010 and had second trimester genetic screening performed. Using banked frozen serum matched by age, race, BMI, parity, season of blood draw, and gestational age at serum collection, we measured levels of 25(OH)D, VEGF, soluble fms-like tyrosine kinase-1 (sFLT-1), and placental growth factor (PlGF). We used non-parametric ROC analysis to compare predictive values of 25(OH)D and angiogenic factors.

RESULTS: Women who later developed severe preeclampsia had significantly lower levels of both VEGF and 25(OH)D in early pregnancy compared to controls (1.6 pg/ml vs 3.2 pg/ml, $p<0.001$; 75.1 nmol/l vs 106.6 nmol/l, $p<0.001$, respectively). We found no correlation between 25(OH)D and VEGF levels ($r_{pearson} = 0.01$, $p=0.87$). 25(OH)D level alone was equivalent as a predictive marker for severe preeclampsia compared to VEGF and sFLT-1/PlGF ratio. A composite of both 25(OH)D levels and sFLT-1/PlGF ratio was more predictive than either alone (AUC 0.78 vs 0.72 and 0.60, respectively).

CONCLUSIONS: Combining circulating levels of 25(OH)D with sFLT-1/PlGF ratio predicts severe preeclampsia better than either marker alone.

38 Prevention of group B streptococcus (GBS) colonization by multiple GBS serotypes using a novel GBS vaccine

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OBJECTIVE: Using a murine model, our objective is to optimize various formulations of our novel, univalent GBS vaccine and determine if they safely promote short and long term immunity and prevent vaginal colonization to multiple GBS serotypes.

STUDY DESIGN: C5a peptidase, a surface protein found on multiple serotypes of GBS, was microencapsulated in Poly lactide-co-glycolide acid (PLGA) using a water in oil in water double emulsion technique. 6-8 week old female ICR mice were vaccinated with 5 different formulations of vaccine: free C5a antigen, PLGA 72:25 0ug, PLGA 75:25 10ug, PLGA 75:25 30ug, and PLGA 50:50 30ug. Vaccines were admin-