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BMI, Gestational Weight Gain and Angiogenic Biomarker Profiles for Preeclampsia Risk

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Background

- In May 2009, after considering short and long-term maternal/child outcomes, the Institute of Medicine (IOM) revised recommendations for gestational weight gain (GWG), however preeclampsia was dismissed due to insufficient evidence.
- BMI Comparisons
- Hypothesis

To evaluate preeclampsia risk by angiogenic-biomarker profile by both BMI and GWG-adherence.

Materials & Methods

- Pregnant subjects <24 weeks gestation enrolled from outpatient prenatal clinics at UMass Memorial Health Care between May 2004 and January 2006.
- Each subject had ≥1 of the following risk factors for preeclampsia:
  - Chronic HTN
  - Renal Disease/CVD
  - Pregestational DM
  - History of Preeclampsia
  - Teen Pregnancy
- Inclusion Criteria
- Exclusions
- Subjects recruited
- Subjects included in analyses 82 (342 samples)

Analysis

- Analytic sample included 82 subjects (342 specimens). See Table 1 for Demographic Comparisons.
- BMI Comparisons (see Figures 1–3)
  - Mean sFlt1 lower in all windows in OW-OB compared to U-N (Figure 1)
  - Mean PI GF lower in all windows in OW-OB compared to U-N (Figure 2)
  - Mean ratio [(sFlt1+sEng)/PlGF] trended higher in OW-OB compared to U-N women at 27-30 and 31-36wks (Figure 3)
- GWG Adherence Comparisons (see Figures 4–6)
  - Mean sFlt1 lower in all windows in OG compared to U-AG (Figure 4)
  - Mean PI GF lower in all windows in OG compared to U-AG (Figure 5)
  - Mean ratio [(sFlt1+sEng)/PlGF] trended higher in OG compared to U-AG at 31-36wks (Figure 6)
- Limitations

  Small sample size required collapsing of BMI and GWG-adherence categories; thus unable to look at adherence within each BMI category
  Secondary analysis not powered for this exploratory analysis
  Only had total GWG at end of pregnancy

Results

- Table 1. Demographic comparisons

- Figures 1-3. Angiogenic biomarker profiles comparing under-/normal-weight to overweight/obese at 3 gestational age windows

- Figures 4-6. Angiogenic biomarker profiles comparing under/appropriate gainers to over-gainers at 3 gestational age windows

Statistical Analysis

- Demographic comparisons utilized Fisher exact test for categorical variables and Wilcoxon rank sum test for continuous variables (see Table 1)
- Within-women correlation and right-skewness handled by estimating linear mixed models for ln-transformed biomarkers and then exponentiating on ln scale (i.e., geometric means).
- Geometric mean and 95% confidence intervals displayed for sFlt1, PI GF and (sFlt1+sEng)/PI GF in each of 3 gestational-age windows for UW-N vs. UW-OB BMI and Under-Appropriate vs. Over-gainers (see figures 1-6)
- T-test compared means in 3 windows.