Pre-pregnancy body mass index and other risk factors for early- and late-onset hemolysis, elevated liver enzymes, and low platelets (HELLP) syndrome: A population-based retrospective cohort study.

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Abstract

Background: Obesity increases risk of pre-eclampsia, but the association with hemolysis, elevated liver enzymes, and low platelets (HELLP) syndrome is understudied. **Objective:** To examine the association between pre-pregnancy body-mass-index (BMI) and HELLP syndrome, including early- vs. late-onset disease. **Study Design:** A retrospective cohort study, population-based data. **Setting:** British Columbia (BC), Canada, 2008/09-2019/20. **Population:** All pregnancies resulting in live births or stillbirths at [?]20 weeks' gestation. **Methods:** BMI categories (kg/m ^{2}) included: underweight (<18.5), normal (18.5-24.9), overweight (25.0-29.9), and obese ([?]30.0). Rates of early- and late-onset HELLP syndrome (<34 vs. [?]34 weeks, respectively) were calculated per 1000 ongoing pregnancies at 20- and 34-weeks' gestation, respectively. Cox regression was used to assess the associations between risk factors (BMI and, e.g., maternal age, parity) and early- vs late-onset HELLP syndrome. **Main outcome measures:** HELLP syndrome. **Results:** The rates of HELLP syndrome per 1000 women were 2.8 overall (1,116 per 391,941 women), and 1.9, 2.5, 3.2 and 4.0 in underweight, normal BMI, overweight and obese categories, respectively. Overall, gestational age-specific rates increased with pre-pregnancy BMI. Adjusted hazard ratio [AHR] was 2.24 for early-onset (95% confidence interval [CI] 1.65-3.04) vs. AHR 1.48 (95% CI 1.23-1.80) for late-onset HELLP syndrome (p-value for interaction 0.025). Chronic hypertension, multiple gestation, hemorrhage (<20 weeks' gestation and antepartum) also showed differing AHRs between early- vs. late-onset HELLP. **Conclusions:** Pre-pregnancy BMI is positively associated with HELLP syndrome and the association is stronger with early-onset HELLP syndrome. Associations with early- and late-onset HELLP syndrome differed for some risk factors, suggesting possible differences in etiologic mechanisms.

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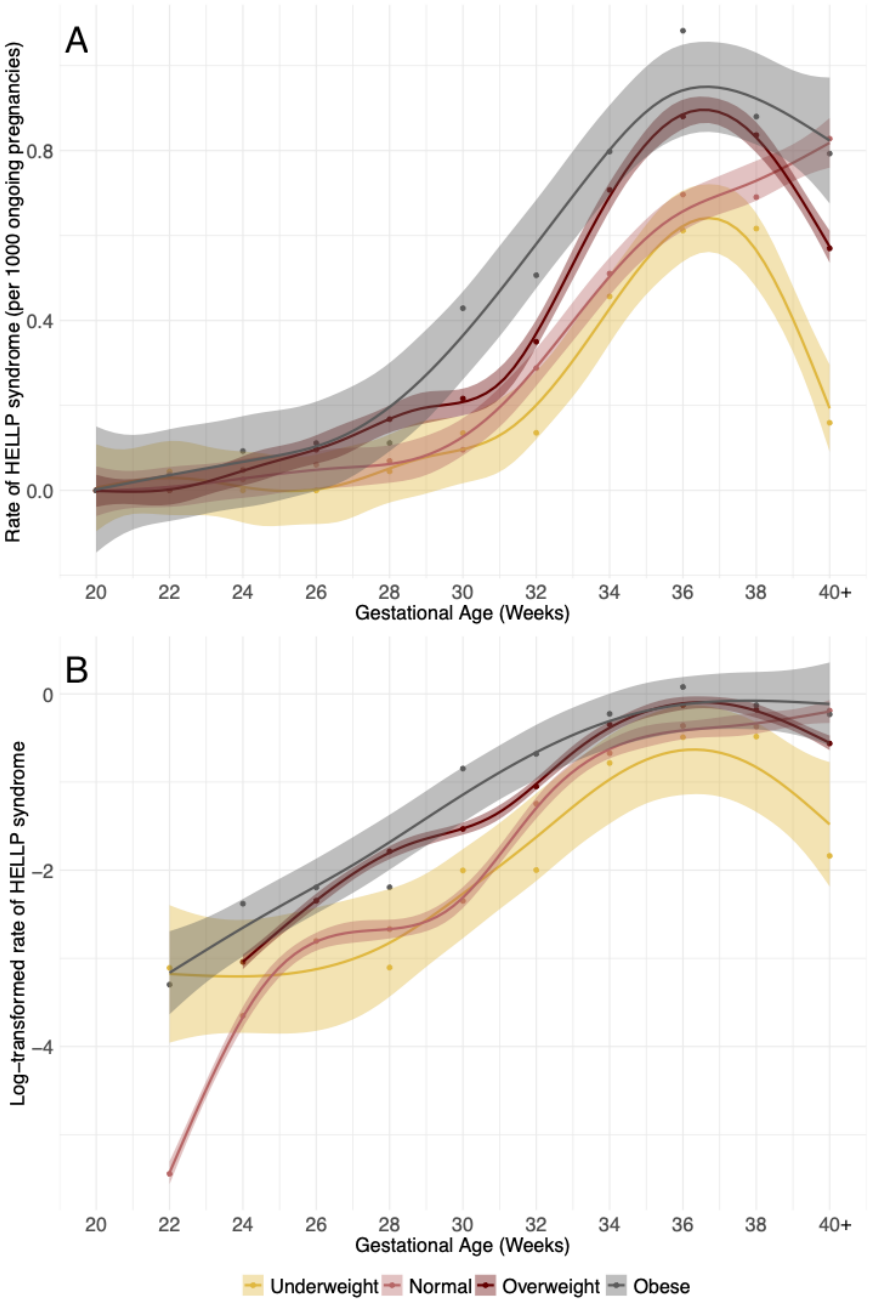

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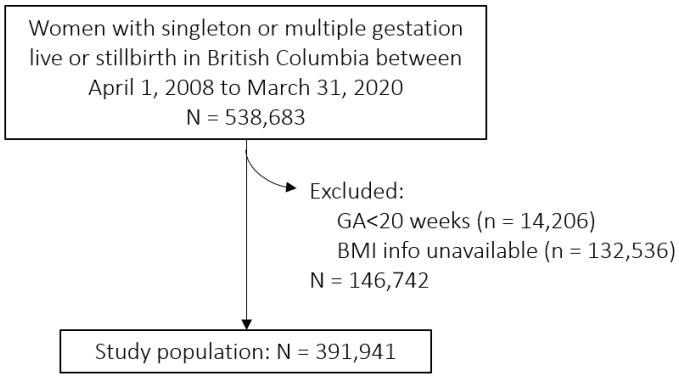

Supplemental Figure 1. Flowchart of study sample selection.

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