Introduction

- Pregnancy is a hypercoagulable state
- Venous thromboembolisms (VTE) is leading cause of maternal death
- 3% of maternal deaths worldwide
- 15% of maternal deaths in the United States
- Platelets are derived from megakaryocytes and have a half-life of 5-10 days
- Activated platelets deliver clotting proteins directly to the blood clot
- Platelets contain a spliceosome that processes pre-mRNA allowing them to respond to external stimuli
- Pathophysiological states can alter platelets and their transcripts

Aims and Objectives

Aim I: Perform comparative transcriptomic analyses of platelets from pregnant mice at 4 stages of pregnancy.

Aim II: Perform functional studies on platelets from pregnant mice at 4 stages of pregnancy.

Methods

Study Design. C57BL/6J mice were bred to generate pregnant mice. The pregnant mice were divided into groups based on gestational stages: early (7-9 days post coitus), middle (11-14 days post coitus), late (16-20 days post coitus), or postpartum. Blood samples were collected and used for platelet aggregation studies to assess for functionality changes or platelet RNA sequencing to identify differences in gene expression. Non-pregnant C57BL/6J mice were used as negative controls.

Results

Platelet Aggregation in Mice Increased in the Late Gestational Group

Figure 1: Platelet aggregation studies with (A) ADP as the platelet agonist and (B) collagen as the platelet agonist.

Table 1: Blood analysis. Ave: average; WBC: White blood cells; abs_lymphs: absolute lymphocyte count; PLT: platelet; MPM: mean platelet dry mass; MCV: mean corpuscular concentration; RCV: red cell volume; HGB: hemoglobin; HDW: hemoglobin concentration.

Conclusions

- Blood volume and platelet count findings are consistent with what is observed in pregnant humans.
- Late gestational increase in platelet reactivity suggests platelet alterations could play a role in increased risk of VTE during pregnancy and immediate post-partum period.
- Multiple blood count parameters are statistically different across gestational groups.

References


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