MSc DEFENCE Monday, December 4th, 2017
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Title: PLACENTAL MITOCHONDRIAL DYSFUNCTION IN RELATION TO PRETERM DELIVERY IN HIV PREGNANCY
Time and location: 9:00am PST; Room V2-222, Clinical Support Building, BC Women's and Children's Hospital, Vancouver, BC
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ABSTRACT

Background: Preterm birth (PTB) (<37 weeks of gestation), is the leading cause of mortality and morbidity among children, responsible for >1 million deaths in 2015 [1]. In North America, PTB occurs in 6–10% of births. However, among pregnant women living with HIV, the rates are higher (18-29%). To date, there is no generally accepted mechanism underlying such increased rates.
One possible explanation is reduced maternal progesterone production during pregnancy, which may be related to HIV infection and/or antiretroviral (ARV) treatment. Synthesis of progesterone (hormone central to pregnancy maintenance), is dependent on placental mitochondrial function. Given that many ARVs can affect mitochondrial (mt) function, I investigated the possible effects of ARV on placental mtDNA content and progesterone levels.

Methods: 136 HIV+ and 60 HIV- pregnant women were enrolled in the Canadian prospective study, the Children and women: Antiretroviral and Markers of Aging (CARMA) cohort. Placenta and blood specimens, as well as clinical and sociodemographic data, were collected. Placental and plasma progesterone levels, as well as placenta mtDNA content, were measured using ELISA and qPCR respectively. We extended these investigations of ARV effects to in vitro models on two human placental cell lines, JEG-3 and BeWo.

Results: Within this cohort, HIV-exposed uninfected (HEU) infants were born at an earlier gestational age ($p=0.017$), with a lower birth weight ($p=0.011$) compared to controls. PTB showed no association with HIV status, placenta mtDNA or progesterone levels. However, higher mtDNA was associated with preeclampsia ($p<0.001$), which often leads to PTB. Furthermore, placenta mtDNA and progesterone levels were significantly negatively correlated to one another ($n=196$, rho=-0,242, $p<0.001$). With respect to ARV exposure during pregnancy, having received a nonboosted-PI PI (23% vs. boosted-PI (66%)($p=0.008$), and having had a cesarian section (vs, vaginal delivery, $p=0.037$) were associated with higher placenta mtDNA.

Conclusions: My results suggest that placental mtDNA content may become elevated as a possible compensatory mechanism for placental dysfunction in women with pregnancy complications.