RANZCOG WOMEN'S HEALTH FOUNDATION RESEARCH SCHOLARSHIPS

NORMAN BEISCHER CLINICAL RESEARCH SCHOLARSHIP, 2019 - 2020

PROGRESS REPORT

Recipient: **Dr Carole-Anne Whigham**
Project Title: *Detecting Circulating Maternal Biomarkers to Predict Fetal Size: FLAG 2 (Fetal Longitudinal Assessment of Growth)'.*

Introduction/Background

The biggest risk factor for unexplained stillbirth is fetal growth restriction, where the fetal weight is less than the 10th centile. The FLAG (Fetal Longitudinal Assessment of Growth) study identified differentially expressed genes at 36 weeks of gestation, in those destined to have a small baby. *We propose developing a blood test that will be able to predict babies who are small as a reflection of placental function on the day that the blood test is done*. Such a blood test could be used in high risk pregnancies or in situations such as reduced fetal movements at term, to identify which babies require urgent delivery in order to prevent still birth.
Aims: 1) to undertake a prospective cohort study examining whether placental proteins and mRNA in the maternal circulation correlate with birthweight on the day of delivery, **2)** to create a multi-marker algorithm that will predict FGR on the day of the blood test.

My role has been in supporting recruitment and characterisation of the patient details. We have fully characterised 1000 pregnancies. I have also been heavily involved in communication between Mercy and our other recruitment site in Chile to help troubleshoot and answer general queries. I have organised the logistics of transporting the Chilean blood samples to Australia as well as organisation of the bloods in our laboratory.

Progress/Update

Progress has been excellent so far with 1638 patients recruited and 1000 patients fully characterized with regards to maternal and baby details such as gestation and birth weight. From the first 1000 patients, we have found 6.8% are small for gestational age which is less than expected, therefore we have continued recruitment in the hope of increasing the number of small babies detected. We aim to have 2000 recruited by the end of 2019 and we are definitely on track for achieving this number.

As per the timeline stated on the RANZCOG grant application form, aliquoting of plasma has been taking place throughout this year. We aim to have the aliquoting completed as recruitment goes on and aim to start running ELISAs in January 2020.

Excitingly, we have discovered a larger than expected proportion of FLAG 2 recruits have babies that are large for gestational age- 15.7%. This leads us to believe that, as well as markers for small babies, there is a high possibility that we will be able to detect large for gestational age babies using protein biomarkers in the maternal circulation.

Conclusions

We have not reached any scientific conclusions at this stage but are running on schedule as per the predicted timeline.

As a result of screening the original FLAG cohort, in which we took bloods at 36 weeks' gestation and correlated levels with birthweight, we have already discovered numerous protein markers that correlate with small for gestational age babies. This has given us a massive head-start in finding molecules that correlate with birthweight on the day of delivery and ultimately markers that correlate with babys' weight on any given day in order to provide us with information on babies that are pathologically small so that we can intervene before a still birth occurs.

Publication and/or Presentation of Results

Nil so far

Budget

Our budget will be used to buy ELISA kits for analyzing the protein make-up of the samples. We plan to investigate several proteins discovered in the original FLAG cohort such as SPINT, syndechan, sFlt:PlGF ratio, DAPK and GDF15.

Please note: Your report should not be more than two pages long (10 point typed, single spaced), plus any figures, graphs, tables or appendices that you consider absolutely necessary. Your report should also be accompanied by a letter of support from your research supervisor confirming their endorsement of your report.