TCS/25/19 - Bleeding after childbirth – exploring abnormal blood clotting and how to treat it

Postpartum haemorrhage (PPH) is the leading cause of global maternal mortality. In the UK, PPH maternal deaths have plateaued over the past 25 years. A subset of PPH cases involves coagulopathy, where haemostatic mechanisms fail, exacerbating bleeding and increasing morbidity and mortality. However, obstetric-specific mechanisms of coagulopathy remain poorly defined, and current management protocols are largely extrapolated from non-pregnant populations.

Our team identified a novel entity termed Acute Obstetric Coagulopathy (AOC), distinct from dilutional coagulopathy arising from large-volume resuscitation. AOC appears unique to the obstetric population and is characterised by early haemostatic failure in the context of PPH. Preliminary data suggest a strong association between AOC and adverse neonatal outcomes, including a high incidence of stillbirth or early neonatal death.

This translational study will investigate the pathophysiology, clinical phenotype, and potential biomarkers of AOC. We will recruit 40 women with AOC, 40 with dilutional coagulopathy, and 30 healthy pregnant controls from across the UK. Uniquely, in the OBS B2B study, we will recruit whole blood samples from women with AOC in Aberdeen. Samples will undergo haemostatic profiling, including viscoelastic testing and targeted coagulation/fibrinolysis assays. In vitro modelling will explore the dynamics of clot initiation, propagation, and fibrinolysis under conditions replicating obstetric bleeding.

This investigation will run in parallel with a national randomised trial OBS UK addressing therapeutic interventions for PPH. Together, these studies will refine the diagnostic and therapeutic approach to coagulopathy in the obstetric setting, with the goal of improving maternal and neonatal outcomes and reducing mortality in PPH.