

The impact of lifestyle and pharmacological interventions on the placenta in complicated pregnancies

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Pregnancy is the greatest physiological challenge a woman will undergo in her lifetime. Normal placental development and function is regulated by a complex series of events, which are prone to disruption in complicated pregnancies. Importantly, research has well established that placental dysfunction is central to the pathophysiology of many pregnancy complications. Obesity rates globally are increasing, so too are the number of obese women who are pregnant, which increases the risk for developing gestational diabetes (GDM). One subset of the population that are prone to becoming obese and developing GDM are females who were born growth restricted. Poor metabolic health during pregnancy has a range of well described adverse pregnancy outcomes for both the mother and her baby, including macrosomia and neonatal hypoglycemia. These pregnancy outcomes are likely, in part, due to dysregulated placental glucose handling. This highlights the need for interventions in women at risk of poor metabolic health in pregnancy to improve their health and their babies' health. Although overweight/obese pregnant women are often advised of the benefits of lifestyle interventions, such as exercise, they generally have low compliance highlighting the need for pharmaceutical interventions. Our laboratory has been investigating the effects of interventions in overweight rats, that were either born growth restricted or with a normal birth weight, to identify the optimal timing for exercise interventions and effects of pharmaceutical interventions to prevent alterations in placental glucose handling, which may prevent offspring diseases.