Innate Immunity in Normal and Adverse Pregnancy

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Editorial

In pregnancy, successful implantation, placental development, and fetal growth, as well as maintenance of both maternal and fetal health, requires immune balance. In case of excessive activation of the immune system, the risk of rejection of the fetus and adverse pregnancy outcomes such as preeclampsia or gestational hypertension may arise. In addition, deficiencies of the immune system can lead to maternal or fetal infection. Due to known cross-talk, both innate and adaptive immunity must be properly regulated. The current Research Topic, however, will focus on the innate immune system, both in its role in adverse pregnancy outcomes, as well as its essential role in normal progression of pregnancy and fetal development.

Previous studies have clearly shown that complement is essential for normal placental and fetal development, but excessive complement activation in hypoxic placenta or in autoimmune-related pregnancy complications is detrimental for both mother and child. NK cells are essential for proper trophoblast migration and placental development, but inappropriate NK cell activation may lead to symptoms of preeclampsia. TLR and inflammasome activation in neutrophils and macrophages are essential for protecting the fetus from infection, whereas excessive activation may result in chronic inflammation, hypertension, endothelial dysfunction and placental damage. Auto-reactive natural occurring antibodies from B1 cells may also be instrumental in the pathophysiology of pregnancy complications. Genetic modifications of any of these innate immune responses can influence susceptibility and immunopathology during pregnancy. In addition, obesity, hypertension, and metabolic disorders contribute as risk factors for adverse pregnancy outcomes.

This Research Topic calls for Original Research, Review, Clinical Trial, Methods, and Perspective articles focusing on, but not limited to, the following subtopics in normal and adverse pregnancy:

1. Role of innate immune cells, including macrophages, neutrophils, innate B1 cells, and NK cells
2. Role of the complement system
3. Role of TLRs
4. Role of autoreactive natural antibodies

Diabetes mellitus (either gestational or pre-gestational) has emerged as one of the most common conditions complicating the pregnancy with a concerning increased prevalence in recent years. Although some of the increase is attributed to modification in the diagnostic criteria, and better reporting on birth certificates on a national level, multiple other medical, social, dietary, and racial factors have been associated. Given the myriad of serious short and long term maternal and neonatal adverse outcomes associated with suboptimal diabetes control, it is of importance that Obstetricians are cognizant of the potential consequences and develop the required expertise to enable early detection, and appropriate counseling and management strategies for such patients.

We welcome manuscripts that focus on normal pregnancy as well as adverse pregnancy outcomes, including preeclampsia, gestational hypertension, antiphospholipid syndrome, fetal loss, preterm birth, recurrent pregnancy loss, abnormal fetal development, intrauterine growth restriction, and infections during pregnancy. In addition, the contributions of genetics, obesity, hypertension and metabolic disorders to increased risk of abnormal fetal development or adverse pregnancy outcomes are of interest.

In this issue, we are calling for authors to contribute with original research and/or review articles focusing on adverse pregnancy outcomes in patients with diabetes mellitus (either pre-gestational type I or II, or gestational diabetes). The scope of this subject thus, is quite broad and may include work related to the detection of, risks leading to, and management strategies that may reduce the different pregnancy complications such as large for gestational age, macrosomia, preeclampsia, polyhydramnios, birth defects, still birth, birth injury, and neonatal morbidity, as well as studying long term maternal and neonatal consequences such as later development of type 2 diabetes and more. In addition, the editors welcome work related to population based evaluation of risk factors (medical, behavioral, social and racial/ethnic factors) and their contribution for such complications is appropriate.