First Words

Infections in pregnancy and the newborn

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... about in 1951 I met in Oxford a very well known scientist and I said to him that I was a friend of Eccles. And be said Eccles [recipient of the Nobel prize for physiology 1963], [was a] very good man but you know the man must be a bit crazy. He refutes his own theories.

Sir Karl Popper

There are many important isssues relating to the investigation of infections during pregnancy and immediately after birth. They relate to the scientific areas of the need for diagnosis, for definition of markers of infection, and for the use of surrogate markers of severity, as well as clinical areas relating to diagnostic and therapeutic interventions. Ideally, at the same time, the integrity of any scientific research done to understand the pathogenesis of damage to the fetus and neonate must not be compromised.

Further, the important area of parental involvement in decision making, often at a time of intense emotion, must be carefully integrated into this process. With parental consent, studies of infections during pregnancy, neonates, and adverse outcomes of pregnancy can be made more effective with a multi-disciplinary approach.

Many of the authors of the articles in this issue of Microbiology Australia have been involved in such approaches to research, diagnosis and therapy of congenital and perinatal infections. In this edition we have papers discussing pathogenetic studies of the role of prenatal infections in later clinical outcomes such as the role of infection in precipitating spontaneous preterm birth, the possible role of enteroviral infection in type 1 diabetes mellitus, and the pathogenesis of damage from cytomegalovirus in pregnancy. In the clinical setting, there are important papers summarising our understanding of infections with malaria, cytomegalovirus, toxoplasmosis and HIV during pregnancy, as well as herpes simplex and respiratory viruses in the newborn.

We also have an article specifically on the personal and social consequences of stillbirth – a problem which results in almost as many deaths in Australia each year as from breast cancer.

In reviewing the findings from studies associating infections with various adverse outcomes of pregnancy, we must avoid simplistically linking association with causation. Infections need to be seen in the context of the maternal-placental-fetal interaction that develops during pregnancy, the changes in the immune system as the fetus is born, and neonatal immunological development. We should consider the results of diagnostic testing as a whole, including all possible information from serological, molecular, microbiological and histopathologic sources. These need to be related to the clinical setting, as testing may be adjunctive, rather than definitive, in the diagnosis of fetal or neonatal damage. We need to be aware of the utility, as well as the limitations, of our current knowledge.

What is important about many of these studies is that the list of potential aetiologies of many conditions is being expanded by the use of nucleic acid and other molecular techniques to define the organisms present more clearly.

It is useful to examine these studies using criteria suggested by Karl Popper – we utilise observation, but such observation is selective and driven by theory. Indeed, as he stated succinctly “Our knowledge can only be finite, while our ignorance must necessarily be infinite.” It is our ability to use the scientific observations relating infection to adverse outcomes of pregnancy and infection in the neonate to inform our current practice that is important for the patients who seek our assistance currently. It is equally important to be able to discard these scientific findings if new findings prove our hypothesis incorrect.

The importance of continuing research in this area cannot be underestimated. Establishing what organisms are important in different adverse pregnancy outcomes, the nature of placental, fetal and neonatal infection with these organisms and the associated host response is vital. The determination of causality (or not) needs to follow soon, if we are to introduce therapeutic and preventive strategies.

Fortunately, there are microbiologists, clinicians and members of the community who are interested in the scientific, clinical, social and personal consequences of infections in pregnancy and early infancy. These are people who continue to propose theories, study and research in this area. They remain prepared, like Sir John Eccles, to use the scientific method to discard incorrect theories, and propose new testable hypotheses. Some of them are represented in the papers presented in this edition of Microbiology Australia, and I hope you find their insights useful.

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