

Predicting Infection-related Risk of Preterm Birth

Research overview

Ureaplasma are one of the most common organisms found within the amniotic cavity and placentas of women who deliver preterm. These bacteria are thought to ascend from the vagina and in some, but not all women, trigger an inflammation response leading to early labour. We propose that the nature of the maternal immune response to Ureaplasma holds the key to clarifying why some women deliver prematurely and others do not. The ability to predict how a woman will respond to Ureaplasma, should she develop an ascending infection, would aid clinicians in managing her pregnancy through to term.

Research highlights

We have collected maternal blood samples from more than 60 women attending KEMH antenatal clinics who consented to vaginal Ureaplasma screening at their 20 week appointment. We isolated immune cells and serum from the blood enabling us to compare monocyte, T cell and antibody responses between Ureaplasma-colonised and non-colonised women.

We found that vaginal Ureaplasma colonisation didn't specifically tolerise monocytes of pregnant women towards a decreased response to subsequent exposure. We did however find that T cells from Ureaplasma-colonised women were more responsive to a second stimulation with Ureaplasma than T cells from non-colonised women suggesting the development of immune memory. Finally, we have shown that IgG type antibodies to Ureaplasma can be detected in most women regardless of current vaginal Ureaplasma colonisation status. Antibodies were detected against a large range of Ureaplasma proteins, with some differences noted between women who subsequently delivered preterm versus at term. We are now confirming these findings and extending the study to include the detection of IgM and IgA type antibodies in serum and vaginal secretions.

Research achievements

Ms Yael Friedland and Ms Nur Abdul Jafar completed their Honours research projects and were awarded 1st Class degrees in 2014. Ms Friedland co-authored a paper describing her monocyte data in the Journal of Reproductive Immunology with a T cell manuscript in preparation. We have also published a discussion on the potential of antibody to Ureaplasma for the prediction of preterm birth in a review article in Frontiers of Immunology. Ms Georgia Peverley is currently completing her Honours research project in our laboratory expanding on the antibody results. The combined data from these studies will be prepared for publication towards the end of 2015 and will mark the completion of this project.

1. Friedland, Lee-Pullen, Nathan, Watts, Keelan, Payne, and Ireland. Whole blood flow cytometric analysis of Ureaplasma-stimulated monocytes from pregnant women. J Reprod Immunol. 2015;109:84-8.
2. Ireland and Keelan. The maternal serological response to intrauterine Ureaplasma sp. infection and prediction of risk of pre-term birth. Front Immunol. 2014;5:624.

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