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Reproductive Immunology – More Important than Ever Before

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Editorial

The situation is actually clear-cut: an embryo is HLA-foreign for the prospective mother due to its foreign, paternal HLA identity. This difference affects an average of 50% of HLA groups. Logically, then, any pregnancy represents an enormous challenge for the maternal immune system. HLA typing undisputedly plays an important role in transplantation medicine, and it is now generally known that immune system reactions must be precisely monitored and treatment given where required. However, pregnancy is often regarded different. The view prevailing in areas including reproductive medicine is that it is “all about the embryo” while the embryo’s foreign HLA is ignored. Current reproductive medicine thus focuses on genetic embryo screening aimed at improving pregnancy rates, with no other general trend in sight.

But interesting aspects may be found in precisely this area – namely the fact that embryos evidently possess self-repairing mechanisms. In 2015 Gleicher et al. published three case studies in which transfer of embryos with monosomy detected in genetic screening resulted in pregnancy, but this monosomy was no longer detectable in the infants after birth. While there is some evidence that these self-repairing mechanisms may be genomic, they also appear to react to external influences, particularly cytokines and growth factors such as those found in high concentrations in the endometrium and incipient decidua [1]. These cytokines and growth factors are primarily produced by immunocompetent cells which colonize the endometrium, particularly after ovulation, and clearly influence the genetics and differentiation of embryos and their stem cells.

A complex network of interactions thus unfolds, in which it is clearly not “all about the embryo” alone; the maternal immune system evidently has an important role. This is also seen in cases of “completely foreign” embryos such as after egg cell donation, embryo donation or surrogate motherhood – all situations in which immune conditions such as pre-eclampsia or HELLP syndrome occur significantly more frequently.

Despite these simple facts, reproductive immunology still has immense difficulty in gaining acceptance, both in reproductive medicine itself and even in any understanding of regulation of pregnancy. Many practising gynecologists asked to define “microchimerism” will respond with a shrug, yet microchimerism is responsible for numerous phenomena during and after pregnancy – and is related to the immunology of implantation and pregnancy.

It is therefore high time that the extensive findings of reproductive immunology also find acceptance and wider consideration in reproductive medicine and obstetrics. Given this, there can never be too many qualified efforts, in the form of publications and published media, to promote reproductive immunology and enhance awareness of the complex processes it involves. Reproductive immunology is therefore more important than ever before.

Reference

1. Gleicher N, Vidali A, Braverman J, Kushnir VA, Albertini DF, et al. (2015) Further evidence against use of PGS in poor prognosis patients: report of normal births after transfer of embryos reported as aneuploidy Fert Steril 104: e59.