

CHAPTER 28

ENDOMETRIUM, EMBRYO AND IMPLANTATION: LITTLE KNOWN FACTS

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What prevents fetal rejection? Endometrium or Embryo?

There are specific immunological relationship between mother and her fetus. They have similar but different genetic properties. During pregnancy, the mother can develop an immunologic reaction against antigens of her fetus. On the other hand, endometrium is not an immunologically privileged organ against other tissues. Administration of immunologically materials such as skin or embryos from other species results in acute rejection. However, in natural or transferred cycles human embryos attach to the endometrium. Possible clues of this selective behaviour seem to be in the changing nature of trophoblast and the endometrium during implantation. Marvelous interaction between embryo and endometrium inhibits the maternal immune response against the antigens of fetus. Possible pathways preventing fetal rejections are;

- Lack of classical transplant antigens in the fetus
- Existence of common s-ligand receptors both in fetus and endometrium
- Decidual dendritic cells-derived maternal tolerance

It is well known that all nucleated cells contain the major histocompatibility complex systems, MHC-I, and MHC-II. While an organism rejects tissue with a different HLA-I within the two weeks rejection of a tissue with a different HLA-II takes place within the two months. As mentioned above, trophoblast cells do not contain conventional transplant antigens. Conversely, trophoblastic cells express only nonclassic types of antigens known as HLA-G and HLA-Y. Interestingly, neither HLA-G nor HLA-Y exhibits antigenic properties and therefore fail to stimulate rejection. A similar feature may also play a role in the formation of endometriosis. If HLA-G-containing menstrual blood reaches the peritoneum with RGM, the endometrial debris can be escaped from the maternal immunity and adhered to the peritoneum. Moreover, involvement of dendritic cells in the establishment of tolerance toward the semi-allograft fetus has been noted. Together, with the help of these extraordinary mechanisms, the mother does not recognize the embryo as self or not-self and fails to reject it in great majority of pregnant women.

euploid blastocysts into the endometrial cavity may result in implantation of both. It is most likely that implantation of two blastocysts might have been elicited at the same time before the closure of implantation district. Clinical observations related with the heterotopic pregnancies support our idea. Total regression of upper part of decidual tissue following implantation of a blastocyst further supports this hypothesis. In contrast, human superfetation cases weaken our hypothesis. Superfetation can be defined as the ovulation, fertilisation and implantation of a second or additional blastocysts into the pregnant endometrium during pregnancy. Incomplete decidual reaction, incomplete closure of one or two tubal ostiums, and the passage of sperm to the uterine tubes lead to superfetation. Accordingly, reaching of any sperm into the uterine tubes may trigger the ovulation. However, it should be remembered that the most of these conditions are seen in some animal species and do not elicit in human reproduction process.

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