Physiology assignment : 18/MHS02//050

**IMPLANTATION**

Implantation is a process in which a developing embryo, moving as a blastocyst through a uterus, makes contact with the uterine wall and remains attached to it until birth. The lining of the uterus (endometrium) prepares for the developing blastocyst to attach to it via many internal changes. Without these changes implantation will not occur, and the embryo sloughs off during menstruation. Such implantation is unique to mammals, but not all mammals exhibit it. Furthermore, of those mammals that exhibit implantation, the process differs in many respects between those mammals in which the females have oestrous cycles, and those mammals in which the females have menstrual cycles. Females in the different species of primates, including humans, have menstrual cycles, and thus similar processes of implantation.

Before embryogenesis begins, the ovary releases an unfertilized egg cell, called an oocyte, which then travels down the fallopian tube. The egg is enveloped in an extracellular matrix called the zona pellucid. Sperm can fertilize the egg in the zona pellucid (ZP), which prevents the fertilized egg, called a zygote, from adhering to the wall of the fallopian tube. If the zygote implants in any area besides the uterus, the result is an ectopic pregnancy. This condition prevents the complete development of the embryo, and it can cause fatal haemorrhaging in the pregnant female.

As the zygote moves through the fallopian tube it undergoes several rounds of cell division, a process called cleavage. These cell divisions produce the inner cell mass (ICM), which will become the embryo, and the trophoblast, which surrounds the ICM and interacts with maternal tissues. Together, the ICM and the trophoblast are called the blastocyst. A blastocyst successfully implants in the uterus when, as the ZP exits the fallopian tube, the blastocyst leaves the ZP and binds to the endometrium.