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ASSIGNMENT ANSWER

* Write a short note on Implantation.

IMPLANTATION

Implantation is the attachment of a fertilized egg to the wall of the uterus and typically occurs between 6 and 12 days after ovulation. Implantation, in reproduction physiology, is the adherence of a fertilized egg to a surface in the reproductive tract, usually to the uterine wall, so that the egg may have a suitable environment for growth and development into a new offspring.

It begins at the end of the first week and is completed by the end of the second week of gestation.

Implantation occurs in the endometrium of the uterus superior in the body region, slightly more often on the posterior than on the anterior wall.

It involves a receptive endometrium and hormonal factors such as estrogen, progesterone, prolactin as well as cell adhesion molecules, growth factors, and HOX genes.

Further, the uterus is ready to accept the implanting embryo only during a limited period of time known as the 'window of implantation', outside of which the endometrium may be indifferent or even hostile to the embryo.

PROCESSES OF IMPLANTATION

Implantation is a progressive and versatile process in which the blastocyst apposes, attaches and finally invades the underlying endometrial surface.

After fertilization and cleavage, the morula reaches the uterus between three or four days of development.

By the fifth day, blastocyst hatches out of the protecting zona pellucida by enzymatically boring a hole and squeezing itself out.

Adjacent cells of the endometrial stroma respond to the presence of the blastocyst and to the progesterone secreted by the corpus luteum by differentiating into metabolically active secretory cells called decidual cells. This response is termed as the decidual reaction.

Secretions of the decidual cells and endometrial glands include metabolites that support the growth of the implanting embryo.

Subsequently, the blastocyst attaches to the endometrial epithelium.

This is the initial phase of the implantation process called "adplantation". This first phase requires the newly hatched blastocyst to loosely adhere to the endometrial epithelium, often "rolling" to the eventual site of implantation where it has firmly adhered.

As soon as it attaches, the trophoblast starts to proliferate rapidly and differentiate into:

The inner layer of cytotrophoblast

The outer layer of syncytiotrophoblast

The fingerlike processes of the syncytiotrophoblast extend through the endometrial epithelium and invade the connective tissue.

By the end of the first week, the blastocyst is superficially implanted in the compact layer of the endometrium.

Subsequently, the uteroplacental circulation develops with the formation of lacunar networks and villi.