NAME: OGUNDUN OPEOLUWA DAMILOLA

MATRIC NO:18/MHS02/130

DEPARTMENT: NURSING

COURSE: PHS 212

ASSIGNMENT: Write a short note on implantation.

***IMPLANTATION***

In humans, implantation is the stage of pregnancy at which the embryo adheres to the wall of the uterus. At this stage of parental development, the conceptus is called a blastocyst. It is by this adhesion that the embryo receives oxygen and nutrients from the mother to be able to grow. Implantation of a fertilized ovum is most likely to occur around nine days after ovulation; however, this can range between six and 12 days. The term "implantation" is used to describe process of attachment and invasion of the uterus endometrium by the blastocyst (conceptus) in placental animals. In humans, this process begins at the end of week 1, with most successful human pregnancies the conceptus implants 8 to 10 days after ovulation, and early pregnancy loss increases with later implantation. The implantation process continues through the second week of development.

The initial phase of the implantation process is **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 is firmly adhered. This process requires both the blastocyst adhesion interaction with the endometrium during the "receptive window”.

Subsequent development of the placenta allows maternal support of embryonic and fetal development. If implantation has not proceeded sufficiently during the menstrual cycle to allow hormonal feedback to the ovary, then the next cycle may commence leading to conceptus loss.

***SIGNS AND SYMPTOMS OF IMPLANTATION***

The signs and symptoms of implantation are your body's way of welcoming you to pregnancy. While many women don't feel anything during the process, others report swollen breasts, light bleeding, and a tender abdomen. Some feel woozy or have headaches.

1. Implantation bleeding: Approximately 15 to 25 percent of women experience light bleeding as a result of implantation. Blood flows when cells shed from the oxygen-rich tissue that lines your uterus during the process. Implantation bleeding will appear days before you expect your menstrual cycle to start, and, compared to your period, will be scant and spotty, starting out pink and turning brown. Unlike your period, it probably won't flow or contain clots, and should stop within a day or two.
2. Implantation cramps: Implantation cramps shouldn't be as uncomfortable as those you might get before and during your period. Instead, you might feel a prickly or tingling sensation in your abdomen, as well as light pressure.

Implantation isn't exactly painful, but very early pregnancy can make you feel sick. Besides cramping, some women have swollen breasts, low energy, headaches and other symptoms. While implantation itself may not be to blame, the cascade of hormonal changes helping your body launch a new life can leave you feeling temporarily weak and woozy.

***IMPLANTATION WINDOW***

The reception-ready phase of the endometrium of the uterus is usually termed the "implantation window" and lasts about 4 days. The implantation window occurs around 6 days after the peak in luteinizing hormone levels. With some disparity between sources, it has been stated to occur from 7 days after ovulation until 9 days after ovulation, or days 6-10 post ovulation. On average, it occurs during the 20th to the 23rd day after the last menstrual period.

The implantation window is characterized by changes to the endometrium cells, which aid in the absorption of the uterine fluid. These changes are collectively known as the plasma membrane transformation and bring the blastocyst nearer to the endometrium and immobilize it. During this stage the blastocyst can still be eliminated by being flushed out of the uterus. Scientists have hypothesized that the hormones cause a swelling that fills the flattened out uterine cavity just prior to this stage, which may also help press the blastocyst against the endometrium. The implantation window may also be initiated by other preparations in the endometrium of the uterus, both structurally and in the composition of its secretions.

***ADAPTATION OF UTERUS***

Predecidualization: The endometrium increases thickness, becomes vascularized and its glands grow to be tortuous and boosted in their secretions. These changes reach their maximum about 7 days after ovulation.

Furthermore, the surface of the endometrium produces a kind of rounded cells, which cover the whole area toward the uterine cavity. This happens about 9 to 10 days after ovulation. These cells are called decidual cells, which emphasizes that the whole layer of them is shed off in every menstruation if no pregnancy occurs, just as leaves of deciduous trees. The uterine glands, on the other hand, decrease in activity and degenerate around 8 to 9 days after ovulation in absence of pregnancy.

The decidual cells originate from the stromal cells that are always present in the endometrium. However, the decidual cells make up a new layer, the decidua. The rest of the endometrium, in addition, expresses differences between the luminal and the basal sides. The luminal cells form the zona compacta of the endometrium, in contrast to the basalolateral zona spongiosa, which consists of the rather spongy stromal cells.

Decidualization

Decidualization succeeds predecidualization if pregnancy occurs. This is an expansion of it, further developing the uterine glands, the zona compacta and the epithelium of decidual cells lining it. The decidual cells become filled with lipids and glycogen and take the polyhedral shape characteristic for decidual cells.

***ZONA HATCHING***

On the endometrium, the apposition is usually made where there is a small crypt in it, perhaps because it increases the area of contact with the rather spherical blastocyst.

On the blastocyst, on the other hand, it occurs at a location where there has been enough lysis of the zona pellucida to have created a rupture to enable direct contact between the underlying trophoblast and the decidua of the endometrium. However, ultimately, the inner cell mass, inside the trophoblast layer, is aligned closest to the decidua. Nevertheless, the apposition on the blastocyst is not dependent on if it is on the same side of the blastocyst as the inner cell mass. Rather, the inner cell mass rotates inside the trophoblast to align to the apposition. In short, the entire surface of the blastocyst has a potential to form the apposition to the decidua.

***IMPLANTATION FAILURE***:

Implantation failure is considered to be caused by inadequate uterine receptivity in two-thirds of cases, and by problems with the embryo itself in the other third.

Inadequate uterine receptivity may be caused by abnormal cytokine and hormonal signaling as well as epigenetic alterations. Recurrent implantation failure is a cause of female infertility. Therefore, pregnancy rates can be improved by optimizing endometrial receptivity for implantation. Evaluation of implantation markers may help to predict pregnancy outcome and detect occult implantation deficiency.

Luteal support is the administration of medication, generally progestins, for the purpose of increasing the success rate of implantation and early embryogenesis, thereby complementing the function of the corpus luterum.