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18/ENG08/020

BIOMEDICAL ENGINEERING

PHYSIOLOGY

ASSIGNMENT

WRITE A SHORT NOTE ON *IMPLANTATION*.

ANSWER

IMPLANTATION

It is a process of attachment and invasion of uterus endometrium by blastocyst in the placental animals. Implantation is the first stage in the development of placenta which is essential for fetus growth and development. Uterus endometrium gets thick, before implantation.

1. The embryo enters into the uterine activity as 8cell morula, before implantation it divides itself into 30 to 200 cell blastocysts before implantation
2. Endometrium prepare itself by complex activity of cytokines, growth factor, lipids modulate for hormones.
3. The process of implantation consists of 3 key steps:
 - a. Apposition – this is a major step in the implantation followed by hatching of blastocyst from its zona pellucida, blastocyst come in contact with uterine luminal epithelium and form weak bond. Structural changes occur, microvilli of the apical surface of cytotrophoblast interlock with micro protrusion called pin pods which are present on the apical surface of endometrium. This interlock causes changes in the body like release of progesterone, preparation of endometrium, yolk Salk development etc.
 - b. Attachment – followed by apposition, adherent or attachment occur, which characterized by increased physical contact with endometrium of the uterus. It is much stronger than apposition, adhering activity occur at microvilli of triploblastic. Triploblastic consist of fiber connection, collagen and integrin

which assist in adhesion activity and cell glycoprotein also help in adhesion.

c. Invasion- it is the further establishment of blastocytes in the endometrium

-blastocytes attaches to endothelial cell

-blastocytes differentiate into inner cytotrophoblast or outer syncytiotrophoblast.

-microvilli of outer part of blastocytes invades the endometrium, blastocytes get embedded into the uterus and defect at the site of invasion is repaired.

-maternal blood filled with lacunae and appears in syncytiotrophoblast this start primitive uteroplacental circulation.

Implantation takes place anywhere between 6 and 12 days after you ovulate. It most commonly occurs 8 to 9 days after conception. So the exact date of implantation can depend on when you ovulated, and whether conception occurred early or late in the ovulation window.

Possible signs of implantation

Bleeding

It's actually a little unclear how common implantation bleeding is. Up to 25 percent of women experience bleeding or spotting in the first trimester and implantation is one cause of first trimester bleeding. This bleeding can be confusing, because it may happen around the time that your regular period would start. Most commonly though, it will occur a few days to a week before you expect your menstrual period.

There are other differences that can help you determine whether you are experiencing implantation bleeding or your period:

- Implantation bleeding is most likely to be light pink or brown (as opposed to the bright or dark red of your period)
- Implantation bleeding is more like spotting than an actual flow of blood. This spotting may occur once, or last for a few hours, or even up to three days.

Cramps

It's no secret that early pregnancy causes a rapid shift of hormones. More

specifically, implantation is a trigger for the hormone surge and the changing hormonal tide can also cause cramping. Furthermore, there's a lot going on in your uterus as the fertilized egg implants and begins to grow.

While there's no research indicating that implantation itself causes cramps, some women do feel abdominal tenderness, lower back pain, or cramping around the time of implantation. This may seem like a mild version of how you feel before your period starts.

Discharge

During ovulation, the cervical mucus will be clear, stretchy, and slippery. After implantation occurs, the mucus might have a thicker, "gummier" texture and be clear or white in color and in the days of early pregnancy, rising progesterone and estrogen may cause the mucus to become even thicker, more profuse, and white or yellow in color.

Bloating

Rising progesterone which happens in early pregnancy slows your digestive system down. This can make you feel bloated.

Tender breasts

After implantation, levels of HCG, estrogen, and progesterone all increase rapidly. This can cause your breasts to feel very sore. While many women experience breast swelling or tenderness before their periods, this is likely to be more noticeable than usual in very early pregnancy.

Nausea

Increased levels of progesterone following implantation can make you feel nauseous. This most common occurs around 4 or 5 weeks of pregnancy. Progesterone slows down your digestion, which can contribute to nausea. Rising HCG levels and a more sensitive sense of smell can make the problem worse.

Mood swings

Estrogen and progesterone, as well as HCG, increase very quickly following implantation. This can make you feel "off" or moodier than usual.

