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**Question**

Write a short note on implantation

**Answer**

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. There is also evidence, from animal models, that a conceptus with major genetic does not develop or implant correctly leading to their loss during the first and second weeks of development.

In recent years with the development or Assisted Reproductive Technologies (ART or IVF) there is a growing interest in this process, with techniques that introduce the blastocyst into the uterus to allow normal implantation to occur. Abnormal implantation is where this process does not occur in the body of the uterus (ectopic) or where the placenta forms incorrectly. In addition, implantation can occur normally but with an abnormal conceptus, as in a hydatiform mole development.

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. There are other symptoms such as:

* Sore Boobs: The pregnancy hormone hCG, estrogen, and progesterone may make your boobs very sensitive to the touch. This happens 1-2 weeks after conception, and it’ll feel more pronounced than normal PMS soreness.
* Nausea: Since your digestive system slows down after conception, some women experience nausea, constipation, and indigestion (although full-fledged morning sickness is still a few weeks away). Progesterone and hCG hormones also contribute to these issues – and so does the heightened sense of smell that many pregnant women experience.
* Darkening of the Areolas: Pregnancy hormones affect nipple cells (called melanocytes) and cause them to darken.
* Fatigue: As your body prepares to grow a baby, you may feel more tired than normal. You can partly blame fatigue on the rise of progesterone and increased blood production.
* Headaches: Are you experiencing tension headaches even though you aren’t prone to them? Increased blood volume and surging hormones may be the culprits.
* Bloating: Unfortunately for your skin-tight jeans, rising progesterone levels can bloat your stomach – similar to what you might experience during PMS.
* Mood Swings: Just like some women get emotional before their period, they might feel extra moody after implantation due to pregnancy hormones.
* Metallic Taste: Thanks to rising levels of estrogen, women may notice a bitterly metallic taste in their mouths following conception.
* Changes in Appetite: It’s not uncommon to have a shift in your taste preferences after getting pregnant, whether you’re suddenly averse to coffee, your favourite dessert, or something else.

**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.