HUMAN REPRODUCTIVE SYSTEM
PREGNANCY AND EMBRYONIC DEVELOPMENT

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- After implantation, finger-like projections appear on the trophoblast called **chorionic villi** which are surrounded by the uterine tissue and maternal blood.
- The chorionic villi and uterine tissue become interdigitated with each other and jointly form a structural and functional unit between developing embryo (foetus) and maternal body called **placenta**.

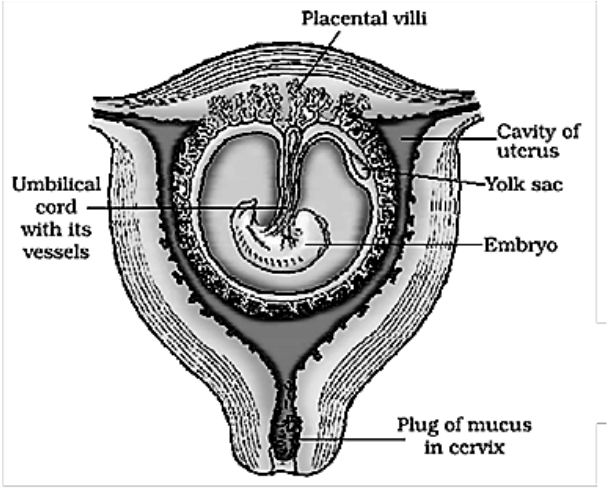

Fig.: The human foetus within the uterus

- The placenta facilitate the supply of oxygen and nutrients to the embryo and also removal of carbon dioxide and excretory/waste materials produced to and from the embryo.
- Placenta also acts as an endocrine tissue and produces several hormones like **human chorionic gonadotropin (hCG)**, **human placental lactogen (hPL)** also called **chorionic somatomammotropin, chorionic corticotropin, estrogens, progestogens,** etc.
- In the later phase of pregnancy, a hormone called relaxin is also secreted by the ovary.

Resonate the Concept

Developing placenta begins to secrete a hormone called hCG, early in the second week after fertilisation. In early stages of pregnancy, hCG stimulates and maintains the corpus luteum that produces progesterone. Thus uterine endometrium and the pregnancy is retained. After 3 months, placenta begins to secrete sufficient progesterone, which will take over the ovarian progesterone for maintanance of uterine endometrium.

- hCG, hPL, chorionic corticotropin and relaxin are produced in women only during pregnancy. During initial stages of pregnancy relaxin and progesterone inhibits myometrial contraction and stabilizes the pregnancy. **Relaxin** hormone is a proteinaceous hormone produced by the ovary. It facilitates parturition by softening the connective tissue of pubic symphysis. In addition, during pregnancy the levels of other hormones like **estrogens, progestogens, cortisol, prolactin, thyroxine**, etc., are increased several folds in the maternal blood. Increased production of these hormones is essential for supporting the fetal growth, metabolic changes in the mother and maintenance of pregnancy.
- Immediately after implantation, the inner cell mass (embryo) differentiates into an outer layer called ectoderm and an inner layer called **endoderm**. A **mesoderm** soon appears between the ectoderm and the endoderm.
- After the formation of three layers, the embryo is called **gastrula.** These three layers give rise to all tissues (organs) in adults. It needs to be mentioned here that the inner cell mass contains certain cells called **stem** cells which have the potency to give rise to all the tissues organs.
- The human pregnancy lasts 9 months. The gestation period of dog is 60-65 days, elephant is 607-641 days and cat is 52-65 days.

1. In human beings, after one month of pregnancy, the embryo's heart is formed. The first sign of growing foetus may be noticed by listening to the heart sound carefully through the stethoscope, placed on the abdomen of the mother (neural tube is first organ to be formed, heart is first organ which become functional).
2. By the end of the second month of pregnancy, the foetus develops limbs and digits.
3. By the end of 12 weeks **(first trimester)**, most of the major organ systems are formed, for example, the limbs and external genital organs are well-developed (Time for sex determination by ultrasonography).

4. The first movements of the foetus **(Quackening)** and appearance of hair on the head are usually observed during the fifth month.
5. By the end of 24 weeks **(second trimester)**, the body is covered with fine hair, eye-lids separate, and eyelashes are formed.
6. By the end of nine months of pregnancy, the foetus is fully developed and is ready for delivery.