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B.Sc HONS Part II Paper IV
Topic- Classification of PLACENTA (Mammalian) According to the Histology.
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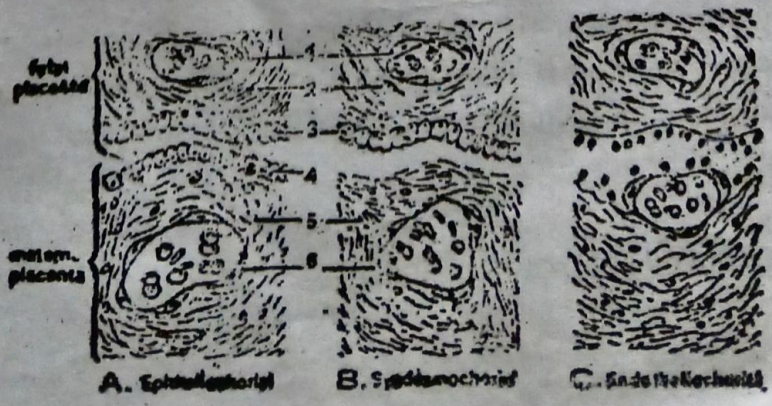
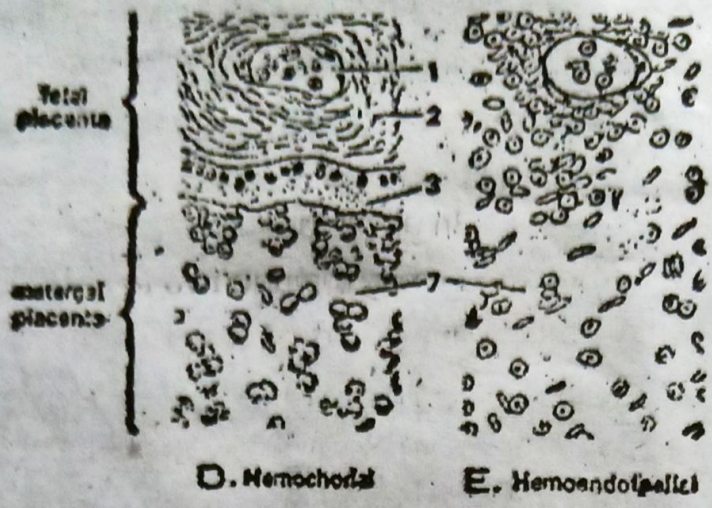
C. CLASSIFICATION OF PLACENTA ACCORDING TO THE HISTOLOGY

On histological basis, following types of mammalian placentae have been recognised-

1. Epithelio-chorial placenta–The epithelio-chorial type placenta is most primitive type placenta and it is found in marsupials, ungulates (pig, saw, cattle etc.) and lemurs. In such a case, no fewer than six tissues or membrance lie between the foetal and maternal blood streams, therefore, the molecules of nutrients and oxygen, for instance, in going from the mother to foetus would pass through in this order–(1) the endothelium of the maternal blood vessel; (2) endomaterial connective tissue (messenchyme); (3) uterine epithelium; (4) the ectoderm of the chorion or chorioic epithelium; (5) chorionic connective tissue (foetal mesenchyme); and (6) the endothelium of foetal blood. Because, the immediate contact of the two halves of the placenta involves chorionic epitheliochorial uterine epithelium, this type of placenta is called epithelio-chorial placenta. The villi of an epithelio-chorial placenta push in the wall of uterus and later lie in the pocket like depressions of the uterine wall.





2. Syndesmo Chrsoal Placenta : In the reminant ungulates (cattle, sheep), the foetal and maternal components are fused so intimately as to result in a destruction of the uterine epithelium, thus, bringing the chorion into contact with the connective tissue of the uterine mucosa. Only five barriers, therefore, the between the two, (viz., foetal and uterine blood streams). This type of placenta is called syndesmo-chorial placenta.

3. Endothelio Chorial Placenta : In carnivores (dogs, cats, bears; etc.) the uterine mucosa is reduced and the chorionic eipthelium comes in contact with the endothelial wall of the maternal (uterine) blood vessels. In such a case, therefore, there lies only four barriers between the foetal and maternal blood steams. This type of placenta is called endothelio chorial placenta.

4. Haemo-chorial Placenta : In the haemo-chorial placenta of primates, insectivores moles, shrews, and chiropterans (bats), a reduction of the barriers to three occurs. In such case, the endothelial walls of maternal (uterine) blood vessel also disappear and the chorionic epithelium is bathed directly in maternal blood. Actualy, the chorionic villi are surrounded by spaces (sinuses) devoid of endothelial lining, into maternal blood enters through the arteries of the uterus and from which the blood flows into the uterine vein.

5. Haemo-endothelial Placenta : In haemo-endothelial placenta of higher rodents (rat, ruginea pig, rabbit), the number of barriers between

the maternal and foetal blood steams is reduced to just two in them, the chorionic villi loss their epithelial and mesenchymal layer to such a degree that in most places, the essentially bare endothelial lining of their blood vessel along separates the foetal blood from the maternal sinuses.

Functions of Placenta : In all histological type of placentae, there exists a placental barrier which may include two to six kinds of tissues. Due to the placental barrier, the blood of foetus and mother is never blended. Physiolo-gically, the placental barrier is like a ultrafilter or semipermeable membrane. Accordingly, there is a relationship between placental transmission and molecular size, smaller molecules passing more readily through placental barrier than the larger ones. This means that water, oxygen, carbon dioxide, soluble organic materials as chloride and phosphates of sodium, potassium and magnesium and soluble organic substances as monosaccharides, hormones, vitamins and urea by diffusion. Macromolecules of poly-saccharides, lipids and proteins may be absorbed tropoblast cells by pinacocytosis.

The antibodies, which have developed in the blood of mother who has acquired immunity to certain diseases, such as diptheria, scarlet fever, small pox and measles, are passed to the foetus, which thus, becomes passively immunized and unsusceptible to these illnesses in the first period after birth. Certain pathogenic organisms and viruses can penetrate through the placental barrier and can infect the foetus if the mother is infected by those pathogens. This is known to happen with syphilis, small pox, chicken pox, measles, and rubella or German measles.

May drugs used medically may penetrate the placental barrier and some times cause most adverse effects on the embryo. Thus it is believed by women in early pregnancy (25 to 44 days), caused very extensive deficiencies in the development of limbs, the alimentary (non-performation of the anus) and the heart.

Besides, acting as to and from passge for maternal and foetal biochemical molecules, the plcenta stores materials such as fat, glycogen and iron; participates in the metabolism of proteins, and its

also acts like endocrine gland. Like an endocrine gland it secretes may
hormones such as estradiol, progeserone, chorionic gonadotropin and
placental lactogen in human female and most palcental mammals. In
some animals such as rabbit, the placenta is a significant sources of
the relaxen, which is a protein hormone for the relaxation of the pelvic
ligaments of facilitate the birth of the young.