

OBSERVATIONS ABOUT PLACENTA DEVELOPMENT IN SEVERAL RODENTS**OBSERVAÇÃO SOBRE O DESENVOLVIMENTO DE PLACENTA EM ALGUNS ROEDORES****Mariana Sincai¹ Adrian Marcu²****- NOTE -****SUMMARY**

The investigations performed on guinea-pig, rat, mouse and coypu (*Myocastor coypus*) placenta revealed some interesting aspects. In these species placenta is at the beginning of pregnancy of discoidal type and after the adhesion between the uterine mucosa and the chorial villies becomes of haemochorial type. The microscopic examiation of the placenta of guinea-pigs and coypus showed to be of a multilobated type while in the rat and the mouse the placenta looks like a half of one placentary lobe from guinea-pig or coypu. This observation could be an embryological proof concernig the phylogenetic evolution of rodents. Microscopic examination of rodents placenta showed that maternal lymphocytes cross the placenta and penetrate the embryonic trophoblast into the fetus that plead for a placentary immunity.

Key words: placenta, rodents, development, phylogenetic, evolution.

RESUMO

A placenta do cobaio, rato, camundongo e ratão do banhado (*Myocastor coypus*) foram estudadas e revelaram aspectos interessantes. A placenta nestas espécies é do tipo discoidal no início da gestação e após a união entre a mucosa uterina com as vilosidades coriônicas passa a ser do tipo hemocorial. O exame microscópico da placenta da cobaia e do ratão do banhado era do tipo multilobular, enquanto que a placenta do rato e do camundongo parece a metade de um lóbulo da placenta de cobaia e do ratão do banhado. Esta observação poderia ser uma prova para a evolução filogenética dos roedores. O exame microscópico da placenta dos roedores revelou passagem de linfócitos através dos trofoblastos embrionários para o feto, o qual precisa de imunidade placentária.

Palavras-chave: placenta, roedores, desenvolvimento, filogenia, evolução.

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Descriptive studies on rodents placenta were effected on some species: mouse (GALL, 1975), rat (DAVIS & GLASSER, 1968; BULMER & PEEL, 1973; HABIGER, 1974) and coypu (HILLEMANN & GAYNOR, 1961).

It was established that rodents had a haemochorial discoidal placenta type. Also the fetal components of mammalian placenta were exhaustively studied especially the corion plate and the trophoblast (EDDERS, 1965; CHARLSON & OLLERICH, 1969; TEKELIOGLU et al., 1975) and also the maternal components respectively the decidual cells (FINN, 1971; TEKELIOGLU et al., 1975) and the circulation of maternal blood. But there are few data about the ontogenic development of the placenta of rodents and their phylogenetic connection and the modification of the relationship between decidual cells and syncytial trophoblast in placenta development. The latter aspects motivated our investigations.

The researches were effected on uterus horns of several rodents in different stages of pregnancy. Uterus fragments were taken from: guinea-pig females 55 and 60 days pregnant, from coypu females 60, 90 and 130 days pregnant, from mouse females 10, 15, 18 days pregnant and from rat females 14 and 18 days pregnant. The sections had been stained with trichrome Mallory method for morphological studies and with periodic acid Schiff methods for carbohydrates, with Dorfman-Epstein method for alkaline phosphatase and pyronin and methyl method for nucleic acids.

The istological investigations of placenta from rat and mouse females 14 days pregnant revealed a discoidal haemochorial placenta type. The yolk sac appears in regression, the amnion shows like a fold of the epiblast and covers round about the embryo. The allantois, of a mesoblast origin is cavitory and rich in mesoblast tissue which forms the allantois blood system. The trophoblast becomes the chorion from which are detached chorionic villi. Each villus contains a core of mesenchyme covered by a layer of cytotrophoblast. The villi are concentrated on a limited zone and penetrate the uterus mucosa and about the maternal circulation. In early pregnancy the chorionic villi do not destruct the wall of blood vessels so at the beginning the placenta is of an haemoendotheliochoric type. The histochemical investigations revealed for trophoblastic cells a massive cross of substances through membranes as an intense secretory activity. They may elaborate stimulating factors for embryonic development.

In the last part of pregnancy were observed lymphocytes passing from maternal circulation into fetal circulation phenomenon that proves the existence of a

placental immunity. Also in the last period of pregnancy of rat and mouse females the placenta becomes of an haemochorial type.

If at beginning of pregnancy the trophoblastic cells of chorionic villi are in close association with maternal decidual cells, toward the end of pregnancy the fetal syncytium becomes close to the endothelial cells of maternal blood vessels.

The connection between trophoblast and decidual cells which are derivatives of the uterine connective tissue (FINN, 1971) is made through microvilli of syncytial trophoblast and extensions of decidual cells. In the second part of pregnancy the microvilli of the syncytial surface are directly connected with the transcytosis mechanism of endothelial cells. The syncytial trophoblast rests on a basal lamina and until the development of fetal blood vessels it is interposed a thin layer of connective tissue. Also most of the peripheral trophoblastic cells become hypertrophic and some of them are in lysis what permits the detachment of the foetus during parturition.

Under microscopic examination of sections from coypu and guinea-pig placental it was observed a discoidal-haemochorial placenta of a multilobular type. Each lobe comprises a central zone with connective structures including the uterine artery, a middle zone with mesenchymal cells and a peripheral zone represented by syncytial trophoblast. Within the placental lobe the maternal blood circulates from the central zone toward the peripheral zone through a labyrinthic system, with flooding of the syncytial trophoblast. From here the nutritious substances are given to the fetus through the venous system (umbilical veins). The fetal blood circulates inverse, from the peripheral zone towards the central zone. In the second part of pregnancy through the destruction of the maternal endothelium the trophoblast comes into direct contact with the maternal blood.

The histochemical studies showed both an absorptive and a secretory function of the syncytial trophoblast.

The placental syncytiotrophoblast seems to constitute the most active group of cells with a secretory activity in producing placental hormones and enzymes. Also the histochemical investigation revealed that in trophoblastic cells take place synthesis and conversion of numerous substances. Also were observed lymphocytes passing from maternal blood into fetal blood like in rat female and mouse female placenta. It is possible that the placenta may be a place for lymphocytopoiesis since some local haematopoietic cells were observed in mouse placenta by DANCIS et al. (1968).

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