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LOCALIZATION OF IMMUNOGLOBULINS IN PORCINE PLACENTA

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The architecture of porcine placentae of 18 to 114 days of gestation was investigated histologically, histochemically and immunohistochemically to elucidate the possibility and the pathways of placental passage of immunoglobulins (Igs) from mother to fetus. In addition, the ability of Igs production in plasma cell series of the fetal lymphatic tissues and the relative concentrations of Igs in the fetal sera from 40 to 114 days were estimated. The results obtained in this study are as follows:

The placental tissue was histologically divided into four areas: chorionic fossa, chorionic ridge, regular areola and irregular areola (IRA). The area latter was subdivided into the fetal IRA, the maternal depression and the marginal region of maternal depression (MRMD). In the ultrastructural study, two kinds of epithelial cells, dark cells and light cells, of which vesicles exhibited a high density and/or had a halo surrounding a material of high density, were observed in the epithelium of MRMD.

From the histochemical study, a reaction suggesting the action of acid mucous polysaccharides was detected in the epithelia of IRA, although they were negative in the other three areas. Moreover, the localization of PAS positive materials, acid phosphatase and iron were demonstrated in the epithelia of four areas.

Intraplacental localization of IgG and IgM were immunohistochemically demonstrated in the epithelia of MRMD and fetal IRA and the endometrial lamina propria mucosae, although IgA was negative. The localization patterns of IgG and IgM were similar to that of acid mucous polysaccharides. In the fetal lymphatic tissues, a small number of IgG-containing plasma cells was first observed on day 114.

In the serological survey, IgG and IgM were demonstrated in a constant level in all the fetal sera from 40 to 114 gestation days, although IgA was positive only in 2 sera from 23 fetuses. Comparing the relative levels of maternal Igs, the fetal Igs were 1/200 in IgG, 1/500 in IgM and 1/1600 in IgA, respectively.

These results suggest the possibility that IgG and IgM pass from mother into the fetus via the epithelia at MRMD.