EFFECT OF CHORIONIC GONADOTROPIN ON PENETRATION OF ALBUMIN-I^{131} THROUGH THE TISSUE – BLOOD BARRIER OF PREGNANT RATS

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Chorionic gonadotropin was found to increase the passage of albumin-I^{131} through the tissue–blood barriers of the liver and ovaries of pregnant rats and to reduce penetration of the isotope into the placenta. Penetration of albumin-I^{131} into the tissues of the fetus is negligible and chorionic gonadotropin had no appreciable effect on its content.

It has been shown [1] that I^{131} passes through the placenta and accumulates in the tissues of the fetus in proportion to its age.

Kivalo et al. [2] determined the passage of radioactive atropine through the placenta and found that its level in the placenta and in the fetal organs was twice as high as in the mother.

This paper describes the results of a study of the effect of chorionic gonadotropin on the passage of albumin-I^{131} through the tissue–blood barrier in pregnant rats.

EXPERIMENTAL METHOD AND RESULTS

Experiments were carried out on 27 pregnant rats weighing 250-350 g (stage of pregnancy 18-21 days).

Chorionic gonadotropin was injected into the rats daily for 3 days in a dose of 10,000 i.u./kg body weight. Control animals received no chorionic gonadotropin.

Albumin-I^{131} was injected intravenously in physiological saline in a dose of 20 μCi/kg.

The rats were killed under superficial ether anesthesia. The radioactivity of the blood, brain, kidneys, ovaries, uterus, mammary glands, and placenta of the rats and of the brain, liver, and kidneys of the fetus, as well as of the fetus as a whole, was investigated. The radioactivity of the tissues was measured by means of a γ-ray scintillation detector (a crystal of sodium iodide with collodion, on a type TsSS 1 apparatus). The index of passage of albumin-I^{131} through the tissue–blood barrier was the radioactivity of 100 mg tissue, expressed as a percentage of the radioactivity of 0.1 ml blood.

The largest quantity of albumin-I^{131} in pregnant rats not receiving chorionic gonadotropin was found in the placenta (31.96 ± 3.14; M ± m.t), ovaries (27.33 ± 5.8), and kidneys (22.8 ± 5.51). The content of the isotope in the liver was 14.6 ± 1.96, and in the uterus 13.4 ± 5.8. The smallest quantity of albumin-I^{131} was found in the tissues of the brain and mammary gland (4.8 ± 2).

Despite the considerable accumulation of albumin-I^{131} in the placenta, only a little of it penetrated into the fetal organs, and its content in the fetal tissues was 2.34 ± 0.44. However, the albumin-I^{131} content in the fetal brain tissue was 2.8 ± 1.1, reflecting the high permeability of the fetal blood–brain barrier to albumin-I^{131}.

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Daily administration of chorionic gonadotropin for 3 days to the pregnant rats led to an increase in the incorporation of albumin-I^{131} in the tissues of the liver (18 ± 1; $P < 0.02$) and ovaries (34.86 ± 4.58; $P < 0.02$) of the pregnant rats and to a decrease in its content in the placenta (24.3 ± 3.2; $P < 0.05$). Chorionic gonadotropin had no significant effect on the content of albumin-I^{131} in the fetal organs.

LITERATURE CITED

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