Immunochemical Analysis of Globulin and Complements in Blood Vessels of Placental Villi during Pregnancy Induced Hypertension

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Summary: The changes of globulin and complements in placental villi blood vessels were immunochemical studied in pregnancy induced hypertension patients and normal pregnant patients by a randomized, double-blind approach. The immunostaining of IgG, IgE, C3, C4, and 5-HT was seen in the villous blood vessels and the helicine arteries of pregnancy induced hypertensive placental villi. The strong positive rates were 100 %, 90 %, 100 %, 100 % and 90 % in serious pregnancy induced hypertensive patients, accompanied by aggregation of mastocytes and vasculopathy of villous blood vessels and the helicine arteries. It is concluded that the immuno-pathological damage took place in the villous blood vessels and helicine arteries, resulting in vasculopathy and villous regressive changes and that the immunological factors were closely related to pregnancy induced hypertension.

Key words: pregnancy induced hypertension; immunology; placenta; vasculopathy

In a recent study we found obvious vasculopathy in placental villi during pregnancy induced hypertension[1]. The pathogenesis of vasculopathy may be related to immuno-pathological damage[2,3]. The purpose of present paper was to study the changes of IgG, IgE, C3, C4, and 5-HT in blood vessel wall of placental villi during pregnancy induced hypertension (PIH), with attempt to find the relationship between PIH and immunology.

1 MATERIAL AND METHODS

1.1 Subjects

The study included 22 PIH patients who received pre-delivery examination and had full term delivery in our hospital from June 1995 to December 1995. They included 10 serious, 6 middle, 6 mild cases of PIH. 10 normal pregnant women served as controls. The age of these subjects ranged from 23 to 34 y and the average pregnancy time was 39 weeks. All patients had no other complications such as liver or kidney diseases, diabetes, primary hypertension and cardiovascular diseases.

1.2 Specimen Preparation

The placental specimens were fixed in 10 % formalin immediately after delivery. After 7 days, the placental specimens were cut longitudinally and a tissue block of about 1 cm X 1 cm X 1 cm in size was collected from the middle of placenta. The tissues were dehydrated and immersed and embedded in paraffin. The temperature for immersion and embedding was controlled under 65 °C to protect the antigenicity of tissues. The block was continuously minced to obtain the tissue slices of 4 μm in thickness, which were then subject to HE stain, Masson trichrome stain, mast cell staining and immunochemical staining. The stained samples were observed double-blindly with light microscope.

1.3 Immunochemical Examination

PAP methods was used. The first antibodies included IgG, IgE, C3, C4, and 5-HT (provided by Beijing Zhongshan Biological Technology, Ltd). The half-quantitative analysis was conducted in term of the stain intensity and density (class 0–3). DAB was used for staining, and the brown color was taken as the positive stain.
1.4 Masson Trichrome Staining

It was performed according to previously published methods\(^4\).

1.5 Statistical Analysis

The tabular data were expressed as $\bar{x} \pm s$ and were analyzed by student's $t$ test.

2 RESULTS

2.1 Mast Cell Staining

A few mast cells were seen in interstitial tissue of placental villi and around the blood vessels in normal pregnant women. A large number of mast cells was aggregated in interstitial tissue and around the blood vessels of placental villi of PIH woman. The mast cell was large, with round or oval shape (fig. 1).

2.2 HE and Masson Trichrome Staining

In PIH patients, the connective tissue was found to increase obviously in interstitial tissue. The elementary membrane of...