EFFECT OF HISTAMINE ON MICROCIRCULATION AND INFLUENCE OF DIPHENHYDRAMINE ON THAT

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The author had reported the effects of denervation, nerve stimulation, and several drugs on microcirculation.

The present study was undertaken to elucidate the effect of histamine on microcirculation, and to know how the antihistaminic drug, diphenhydramine, counteract the histamine effect.

Both side of skin and cartilage were removed roundly by about 1.0 cm diameter in a central part of rabbit ear lobe, and inserted the chamber made by transparent plastic to the removed area. The microcirculation in the window was observed and photographed microscopically in non-anesthetized animal. Histamine hydrochloride and diphenhydramine hydrochloride (Restamine) were used for the experiments.

Histamine administered intravenously did not produce any marked effect on microcirculation in a dose of 0.01-0.03 mg/kg. It showed a strong vasoconstrictive effect on arteries and small arteries when injected in a dose of 0.05-0.1 mg/kg, whereas it acted vasodilatively on arterioles and capillaries. Some of resting true capillaries became active condition and erythrocytes running in that were observed. It also acted slight dilatively on arterio-venous anastomoses which are muscular structure and send the blood directly from artery to vein. Venules exhibited a minor dilatation or no change, and, in small veins, any marked changes could not be observed (Fig. 1).

Diphenhydramine given intravenously in a dose of 2-3 mg/kg, induced a slight vasodilatation in arteries and small arteries, while it did not showed any marked changes in capillaries and veins.

Histamine, injected in a dose of 0.1 mg/kg after administration of diphenhydramine, acted vasodilatively on arterioles and capillaries, and small arteries and arteries likewise exhibited a vasodilatation spite of showing a vasoconstriction by histamine alone. It did not produced any marked changes in veins.

When the mixed solution, histamine (0.1 mg/kg) and diphenhydramine (3 mg/kg), was administered intravenously, a slight vasoconstriction occurred initially in arteries and small arteries, then a subsequent vasodilatation was observed. In a case, a spontaneous and rhythmical contraction and dilatation was seen for a few minutes, more strongly than normal condition, in arteries and small arteries. It dilated capillaries and arterio-venous anastomoses without inducing the initial contraction.

The counteraction between histamine and different doses of diphenhydramine or other antihistaminic drugs in microcirculation was not investigated further.

Arteries, veins and capillaries are greatly varied in histologically and physiologically, and the susceptibility to drugs is likewise varied in its different parts of vascular system.
Fig. 1. A: Small artery, V: Small vein, a: Arteriole, v: Venule.
1, 2, 5, 6: Control, 7, 8: Diphenhydramine, 3, 4: Histamine, 9, 10: Histamine after diphenhydramine.

REFERENCES