THE EFFECT OF VITAMIN P ON THE PERMEABILITY OF THE VESSELS OF THE ANTERIOR CHAMBER OF THE EYE IN RABBITS

(PRELIMINARY COMMUNICATION)

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This investigation was to study the changes taking place in the permeability of the vessels of the anterior chamber of the eye to fluorescein, in rabbits receiving a daily dose of 500 mg of vitamin P (tea catechols) by mouth.

EXPERIMENTAL METHOD

The permeability was measured fluorometrically by E. G. Mikheeva's method. The fluorescein solutions used were in dilutions of 1:48 000 to 1:5 120 000.

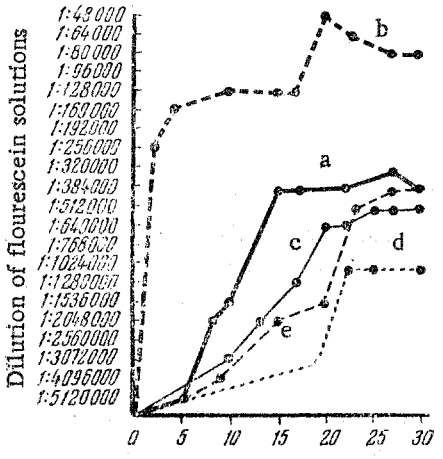

Fig. 1. Changes in the permeability of the vessels of the anterior chamber of the eye in the experimental rabbit no. 712. Conventional signs: a) in the control rabbit; b) after subconjunctival injection of ethylmorphine hydrochloride; c) 3 days after administration of 500 mg of vitamin P; d) 6 days after administration of 500 mg of vitamin P. Time of investigation of fluorescence 30 minutes.

Fluorescein was injected intravenously into rabbits in doses of 10 mg/kg body weight, i.e. 0.2 ml of 5% solution per kg body weight. The fluorescence of the humor in the anterior chamber of the eye was measured every 2 minutes during the 30 minutes after injection of the dye into the animal. The biological action of vitamin P can be shown both experimentally and clinically against a background of increased permeability of the vascular wall. The increased permeability of the vessels, caused by injection of 1 ml of 3% ethylmorphine hydrochloride beneath the conjunctiva of each eye 15 minutes before the investigations, was therefore measured in each rabbit 48 hours after investigation of the normal permeability. The rabbits were used in the experiment only after the measurement of the normal and increased (after injection of ethylmorphine hydrochloride) permeability, and during this time they received vitamin P by mouth every day. Subsequent measurement of the permeability in the experimental animals were also carried out in the presence of increased permeability.

The experiments were performed on 11 chinchilla rabbits weighing from 2.5 to 3.0 kg. The experimental animals were under observation for from 10 to 25 days.

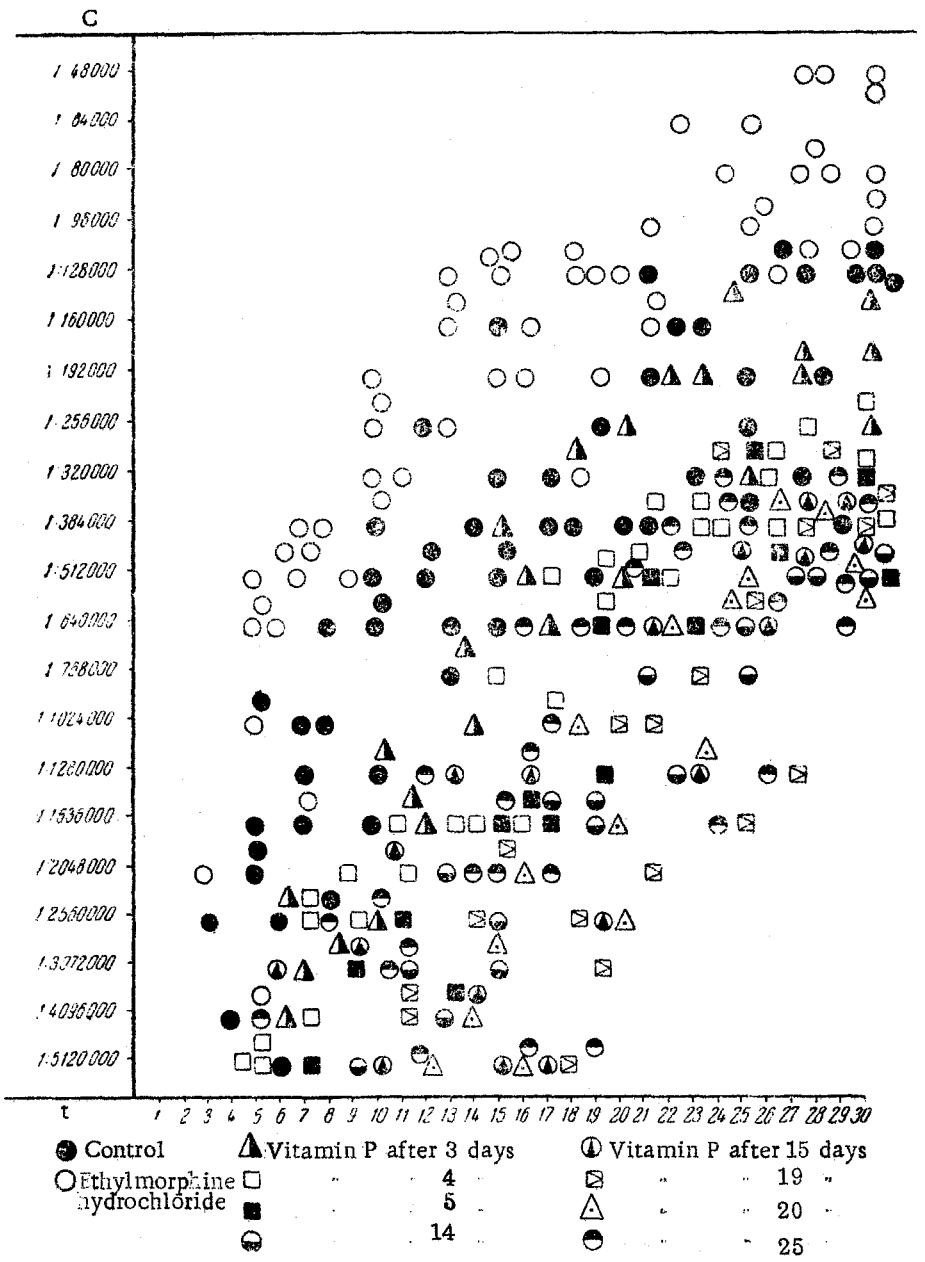

Fig. 2. Changes in the permeability of the vessels of the anterior chamber of the eye to fluorescein in 11 rabbits, in experiments in which vitamin P was given in a dose of 0.5 g after the subconjunctival injection of ethylmorphine hydrochloride.

EXPERIMENTAL RESULTS

Typical changes in the accumulation of fluorescein in the humor of the anterior chamber of the eye in rabbit No. 712, which received vitamin P daily in a dose of 500 mg, are shown graphically in Fig. 1. After only 3 days, the permeability of fluorescein in this rabbit was subnormal, and it remained at this level until the end of the experiment (6-10 days).

In the presence of increased permeability due to ethylmorphine hydrochloride the concentration of fluorescein in the humor of the anterior chamber was not less than 1:192 000 in the majority of experimental animals. The limit of accumulation of the dye in the humor of the anterior chamber under normal conditions in the experimental animals did not, as a rule, exceed a concentration of 1:256 000. The permeability of the vessels of the experimental animals receiving large doses of vitamin P to fluorescein was subnormal after 3 days, and remained at this level until the end of the experiment (Fig. 2).

The restoration of the normal permeability of the vessels of the anterior chamber of the eye to fluorescein depended on the dose of vitamin P. After a dose of 5 and 15 mg the permeability returned to normal in the majority of cases after 2 days. In some rabbits normal permeability was restored more slowly (after a dose of 5 mg – after 3 days, and after a dose of 15 mg – after 4 days).

On increasing the dose of vitamin P to 25 mg, the permeability of the vessels returned to normal in the majority of animals not before 5 days, and in one case 7 days from the time of administration.

The results obtained show that the biological effect of different doses of vitamin P is evidently due to the fact that its influence on the permeability of the vessels is closely connected with the dose given.

SUMMARY

Experiments were performed on 11 rabbits. The author studied the biological effect, of vitamin P on blood vessel permeability to fluorescein in the anterior eye chamber by comparative fluorometry. The accumulation of this dye in the aqueous humor was also studied in normal conditions and against the background of increased permeability caused by ethylmorphine hydrochloride.

Permeability of the vessels was found to be below normal 3 days after the administration of vitamin P (500 mg) and remained unchanged until the end of this experiment (25 days).

LITERATURE CITED

[1] E. T. Mikheeva, Scientific Papers and Technical Information from the Helmholtz Research Institute of Diseases of the Eye, No. 5, pp. 245-251. Moscow 1957 [In Russian].