Osmotically Induced Change in the Volume of the Vitreous Body Causing Protrusion of the Ocular Diaphragm

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In a series of experiments in rabbits it was found that a single massive injection of urea produced severe disturbances in the osmotic equilibrium at the blood/aqueous barrier and at the vitreous barrier. About two hours after the injection the gradient at the blood/aqueous barrier was restored to the normal ratio of 5 : 4 for blood and aqueous humor. About 7 hours after the injection a temporary relative excess in urea concentration of the vitreous body was manifest. Serial recordings of the anterior chamber depth and I.O.P. revealed an unmistakable increase in the size of the posterior segment in rabbits' eyes almost exactly seven hours after the injection of identical amounts of urea as those used in the first series.

As at that moment only the urea gradient at the vitreous barrier was disturbed by excess concentration inside the barrier and there was no other cause that could reasonably be blamed for such an effect, the diaphragmatic protrusion that was recorded in 10 out of 11 cases must be attributed to an increase in the size of the vitreous body from an excess uptake of water to compensate for the existing hypertonicity. Therefore: 1. the volume of the vitreous body is not stable but

is dependent

i.e.

on the condition of the blood; 2. diaphragmatic protrusion can be produced by vitreous edema.

Will be published in extenso elsewhere.