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The Mydriatic Effect of a Mixture of Ephedrine and Homatropine.

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The use of a mixture of ephedrine and homatropine as a mydriatic for diagnostic purposes has been recommended by Geppert and Groenouw.¹ They found that a small amount of homatropine enhances the mydriatic effect of ephedrine, and the time at which mydriasis passes off is practically equal to ephedrine. Later this observation was repeated by many clinicians² using "Mydrin", which is a mixture of ephedrine and homatropine. By comparative experiments with ephedrine and homatropine we have further observed the mydriatic effect of this mixture.

White rabbits were used. The horizontal diameter of the pupil was measured in a dark-room, the source of light being at a constant distance. The change of pupil in strong light was also observed at a constant distance from a lamp. The drugs were applied to the conjunctival sac. A great number of preliminary experiments showed that the pupil on both sides responded to the drugs at practically the same rate and strength. The mixture of ephedrine and homatropine was in the proportion of one hundredth part of the latter to one part of the former substance.

In 6 experiments the mydriatic effect of a small dose of ephedrine on the homatropinized eye was observed. A small amount of homatropine such as one drop of 0.001% to 0.005% solution was applied to the eye on one side (which would produce a dilatation of 1 to 2.5 mm.) and half an hour later one drop of 0.1% to 1% ephedrine solution was applied to the homatropinized eye and also to the eye of the other side. In one case ephedrine (7 mg. per kilo) was injected intravenously. The homatropinized pupil was further dilated by ephedrine but its dilatation was simply due to an additional effect of the mydriatic action of ephedrine and homatropine and was not an augmentation of the homatropine effect.

In 11 experiments a mixture which was prescribed by Geppert and Groenouw for clinical purposes, was used. This mixture con-

¹ Geppert and Groenouw, *Dtsch. Med. Wochenschr.*, 1894, 161.

² Stephenson, S., *The Lancet*, 1898, ii, 24; Suker, *New York Med. J.*, 1895, 714; Cattaneo, *Clinica Moderna*, 1896, July; Snell, S., *Clinical J.*, 1895, Nov.; Sattler, C. H., *Klin. Monatsbl. f. Augenheilk.*, 1927, lxxix, 524, etc.

sisted of a watery solution of 10% of ephedrine and 0.1% of homatropine. One drop was placed on the eye of one side and its mydriatic effect was compared with one drop of 10% ephedrine solution (Fig. 1) or 0.1% homatropine solution (Fig. 2), which was applied to the eye of the other side in the same rabbit. In 5 cases the mydriatic effect of this mixture was compared with the effect of the subsequent addition of ephedrine of the same strength, applied after producing a maximal effect with one drop of 0.1% homatropine solution (Fig. 3). A further comparison was made of the effect of homatropine of the same strength applied after ephedrine (Fig. 4).

The results may be summarized as follows: 1. The duration of

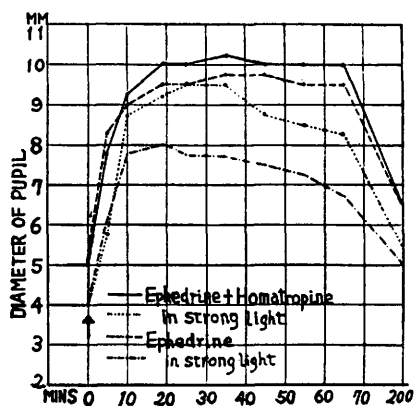


FIG. 1.

Comparison of the mydriatic effects of the mixture and ephedrine.

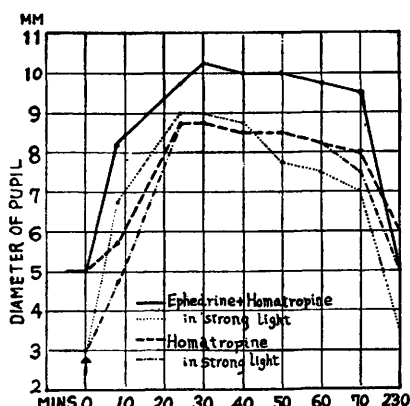


FIG. 2.

Comparison of the mydriatic effects of the mixture and homatropine.

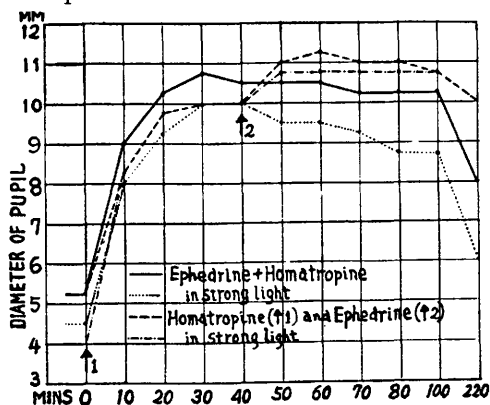


FIG. 3.

Comparison of the mydriatic effect of the mixture and the effect of ephedrine after homatropine.

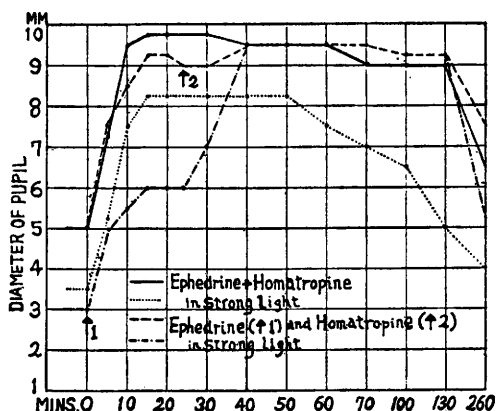


FIG. 4.

Comparison of the mydriatic effect of the mixture and the effect of homatropine after ephedrine.

the mydriatic effect of the mixture seems to be shorter than that obtained with homatropine and practically equal to ephedrine. 2. The mixture does not react to the light as much as ephedrine but is more reactive than homatropine. 3. The rate of dilatation of the pupil with the mixture is more rapid than with homatropine but at about the same rate as ephedrine. 4. The maximal dilatation with the mixture is greater than ephedrine or homatropine. 5. The 2 drugs given in sequence do not yield the same results as the mixture. Ephedrine given after producing a maximum effect with homatropine produces a further dilatation which is greater than that produced by the mixture; the light reflex abolished after homatropine is slightly recovered by adding ephedrine. Homatropine applied after ephedrine shows a dilatation similar to the mixture but the reaction to light is further greatly diminished. The mydriasis obtained by applying ephedrine and homatropine in sequence returns more slowly to the normal than the mixture.