EFFECT OF "MYANESIN" ON INTRA-OCULAR PRESSURE*

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TENSION of the lids and the extra-ocular muscles is very noticeably reflected in intra-ocular pressure (Duke-Elder, 1938). This fact, recognized for quite a long time, has provoked attempts to reduce intra-ocular pressure by diminishing the tension of the extra-ocular muscles. Von Hippel and Grünhagen (1868) made experiments on these lines with curare and several workers have since followed their example. Hofmann and Holzer (1953) reviewed these studies in detail, when describing their own experiments with curare, decamethonium di-iodide, and succinyl bicholinester. They noted that the first two reduced intra-ocular pressure, but that succinyl bicholinester increased it, apparently through muscular contraction. The various effects of these three substances are centred upon the myoneural junction.

Because of its transient effect, very little could be expected of curare as a permanent treatment for glaucoma, but in its capacity as a temporary alleviator of intra-ocular pressure it might prove a significant aid in the reduction of operative complications. In this way it was first used by Kirby (1950).

The fact that curare paralyses the respiratory muscles restricts its use in ocular operations performed under local anaesthesia. This has inspired the search for a drug which would give similar muscular relaxation without undesirable and injurious effects. "Myanesin" (B-dihydroxy-(methylphenoxy)-propane)[†] is such a drug. The manufacturers state that it acts centrally by diminishing the reflex excitability of the spinal cord and not on the myoneural junction as does curare. It does not act on the higher centres and consciousness is not affected. The drug has no relaxing effect on the extra-ocular musculature and it therefore does not effect the intra-ocular pressure in the same way as curare.

The general muscular relaxation in itself may be supposed to have some kind of effect on ocular pressure; at least it is helpful in diminishing the patient's state of tension during an operation. With this in mind the effect of "Myanesin" was studied at the Ophthalmic Department of the Kivela Hospital, Helsinki, and some interesting results were obtained. The drug has also been used elsewhere as an aid in ophthalmic operations (Girgis, 1953).

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[†]British Drug Houses Ltd., London.

Method

To make the effect as rapid and intensive as possible Myanesin was administered intravenously. The dose was 10 ml. Myanesin diluted with an equal amount of sodium chloride, injected slowly into the vein. The injection was accompanied by slight dizziness and sensation of heat in the skin similar to that experienced in connexion with injections of calcium. No other side-effects were noted. The effect of the injection was examined by measuring the ocular tension every three minutes, and by watching the size of the pupil, the function of the extra-ocular muscles, and any other changes that appeared.

Results

Unless the eye had been affected at the same time by a miotic, the size of the pupil did not change. The movements of the lids and the eye slowed down for about 15-20 min. after the injection but the lid muscles and extra-ocular muscles did not become paralysed and retained the full range of vision.

Acute Inflammatory Glaucoma (8 cases).—Two patients were treated with pilocarpine-physostigmine drops every hour for 24-48 hrs without results, before the administration of Myanesin. After the Myanesin injection the tension immediately lessened somewhat; after about 20 minutes it rose again, before returning finally to the normal level.

In four cases, which were new and had not been treated before, Myanesin was used without any preceding miotic. In these cases, too, a fall in tension was noted soon after the injection, but began to increase later, in some quite soon, in others about 20 minutes after the injection, i.e. when the effect of the Myanesin on the musculature was subsiding.

When these patients were given miotics the pupil diminished rapidly and the tension was restored to normal (Fig. 1). Although local treatment was discontinued the tension remained normal on the following day and lower than in the healthy eye. Only after this was customary local treatment begun.

While the patient was under the effect of Myanesin the tension in the healthy eye was also measured and was found to follow the variations in the diseased eye for the 20-25 minutes of the Myanesin effect.

In two cases no reaction occurred.

Absolute Inflammatory Glaucoma (4 cases).—No lowering of tension was achieved in spite of simultaneous treatment with pilocarpine-physostigmine; these cases remained completely refractory to all conservative treatment.

Glaucoma Simplex (2 cases).—The curves of the ocular tension corresponded to those of healthy eyes. During the muscular effect of Myanesin a slight reduction was noted in the intra-ocular tension.

Secondary Glaucoma, Chronic Iritis, and Complicated Cataract (4 cases).—A slight reduction of tension was noted immediately after the injection, but it rose to the earlier level before 20 minutes had elapsed and in some instances even exceeded the original level.

Secondary Glaucoma (1 case).—This patient, in whom glaucoma was associated with acute purulent iritis, had been treated with scopolamine and cortisone for one week with no results. The ocular tension remained continuously between 50 and 60 mm. Hg Schiötz. After injection of Myanesin the tension decreased at once to below 40 mm. Hg Schiötz and then slowly rose to normal in about 2 hours. After this it remained at a low level (Fig. 2).

FIG. 1.—Acute inflammatory glaucoma treated with Myanesin and physostigmine.

FIG. 2.—Purulent iritis and secondary glaucoma treated with scopolamine, cortisone and Myanesin.

Comment

If the patient reported pain in the eye, the pain disappeared at once when the injection was given. It is interesting to note that with a sharp fall in tension the pain returned in some cases, but disappeared when the tension became normal again.

In cases with corneal oedema caused by the raised pressure, an interesting phenomenon occurred; the obscurity cleared up somewhat before the actual reduction of tension, though the final clarification occurred only after the tension had become distinctly reduced.

The number of cases is so small that the results cannot be generalized, yet it seems possible to deduce some interesting points.

Myanesin, when administered intravenously, has a reducing effect on ocular tension in certain cases. No changes can be noted in the size of the pupil. The lowering of the tension is apparent both when miotics are used simultaneously and in secondary glaucoma in association with mydriatics.

The immediate reduction in ocular tension after the injection may for the most part be attributed to the general muscular relaxation. On the other hand, the final normalization of the tension later remains unaccounted for according to what is known of the pharmacological properties of Myanesin.

The actual normalization of the tension usually occurs 20-30 minutes after the injection, when the effect of Myanesin on the musculature is waning. Possibly some substance affecting the ocular tension is produced in the organism by the disintegration of Myanesin, or perhaps the Myanesin affects some neural system or neural centre other than that hitherto recognized. The effect differs greatly in different forms of glaucoma.

The cases recorded above are few, and in a larger series the results may prove entirely different, Myanesin seems to be a valuable aid in treating cases of glaucoma with high tension, and may offer a new line of research into the problems of this disease.

REFERENCES

- DUKE-ELDER, S. (1938). "Text-book of Ophthalmology", 2nd imp., vol. 1, p. 508. Kimpton, London.
- GIRGIS, A. M. (1953). *British Journal of Ophthalmology*, **37**, 185.
- HIPPEL, A. VON, and GRÜNHAGEN, A. (1868). *v. Graefes Arch. Ophthal.*, **14**, pt. 3, p. 219.
- HOFMANN, H., and HOLZER, H. (1953). *Klin. Mbl. Augenheilk.*, **123**, 1.
- KIRBY, D. B. (1950). *Arch. Ophthal. (Chicago)*, **43**, 678.