TREATMENT OF LIME BURNS OF THE EYE WITH CORVASYMTON AND UNDERMINING OF CONJUNCTIVA

BY

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The satisfactory results of the treatment of chemical burns of the eye with "corvasymton" as reported by Fischer, Hodgson, and Wagenaar (1950) and Wagenaar (1952) drew my attention to this new preparation. Its use started quite accidentally when in a carbide burn of the eye it was instilled by mistake instead of vitamin A oil. The cornea was clear and transparent after instillation every 15 minutes for three hours. A generous supply of corvasymton enabled me to carry out an intensive treatment of several cases of lime burns of the eye. Here is a record of some of them.

Case 1

On June 24, 1952, a 23-year-old man was hit on the right eye by a handful of quicklime thrown at him by a fellow workman. When at last the eye was cleansed of all particles of lime, by means of copious irrigations with saline solutions and by pledgets of cotton-wool carried on a conjunctival forceps, the lower third of the cornea presented a porcelain-white appearance. The remaining part of the cornea was so hazy that the iris could scarcely be seen. The conjunctiva of the entire lower fornix was greyish white in colour, and showed such a severe degree of chemosis that no blood vessels could be seen. Vision was reduced down to vague hand movements.

The eye was immediately operated upon. The "necrotic" conjunctiva was loosened up by means of a straight keratome along the limbus corneae in a sector between 5 and 7 o'clock and extensively undermined in a peripheral direction down to the fornix. The conjunctiva was cut at the limits of the undermined area so that a trapdoor flap with the hinge at the fornix was formed. A portion of the sclera was laid bare. No part of the conjunctiva or subconjunctival tissue was removed. There was no loss of blood. This fact suggests that there was occlusion of the blood vessels. The eye was irrigated with corvasymton 10% and instillation continued every hour.

The chemosis soon started to subside and the conjunctiva regained very gradually its normal pink colour. The cornea took a longer time to acquire its bright healthy appearance. The cloudiness of the upper part of the cornea was the first to disappear, and, except for one tiny spot at 6 o'clock near the limbus, the porcelain-white patch cleared off completely. There remained, however, a small narrow symblepharon deep down in the lower fornix in the same line as the spot on the cornea; it never showed any sign of increasing in extent, and no further intervention was necessary.

Vision in both eyes was 6/12 unaided and 6/6 with glasses. There was never any sign of a rise of intraocular tension and there were no corneal vascular changes. Atropine was never used. The patient was discharged three weeks after admission. I think that, had I loosened up the conjunctiva at the limbus along a wider section, both the corneal opacity and symblepharon would have been prevented.

Case 2

On July 17, 1952, a 17-year-old youth was admitted into hospital for a lime burn of the right eye. On examination the cornea and conjunctiva presented much the same degree of injury as Case 1. No blood vessels were to be seen on the chemotic conjunctiva of the lower fornix. There was a

porcelain-white patch on the lower part of the cornea. Diffuse cloudiness of the cornea was very marked. Vision was limited to hand movements.

As there was a considerable degree of blepharospasm, the patient was operated on under general anaesthesia. All residual particles of lime were removed. The same procedure was followed as in Case 1. However, in an attempt to prevent all possible complications, I loosened up the ocular conjunctiva on a much wider section—that is, between 3 and 9 o'clock (see Fig.). The eye was then irrigated with corvasymton solution and instillation continued hourly.

The chemosis gradually disappeared and the conjunctiva soon began to show its normal appearance. The conjunctival flap was noticed to gain reattachment to its scleral bed. The cloudiness of the cornea gradually disappeared. After one week the patient started to complain of pain in the eye. Instillation of fluorescein solution revealed a fairly large staining spot in the cornea near the limbus at 6 o'clock. The eye was kept bandaged between the instillations. After five days there was no sign of corneal staining.

When discharged after three weeks the cornea was clear and the lower fornix was completely free. No corneal vascularization was present. One month after being discharged the vision in both eyes was 6/6.

Case 3

A boy aged 8 was struck in the left eye by a piece of quicklime. The injury was localized mainly to the upper fornix region. The cornea was diffusely hazy and he could count fingers at one metre. Instillation of corvasymton every hour was immediately started. As the chemosis was not pronounced, no undermining of conjunctiva was performed. Three days later it was noticed that the conjunctiva in the inner angle of the upper fornix was very swollen. The patient was examined under general anaesthesia. A piece of lime had burnt its way deep into the conjunctiva, which was loosened up throughout the upper half of the limbus and deeply undermined peripherally. The piece of lime along with the conjunctiva was excised.

Recovery was quick and complete. When the patient was discharged two weeks later there was a small adhesion deep into the inner angle of the superior fornix corresponding to the excised parties of the conjunctiva. The cornea was completely free from opacities. Vision was 6/6.

Case 4

A man aged 35 was injured in both eyes by a splash of quicklime. The burn was mainly limited to the corneae, which were very hazy. There was a moderate degree of swelling of the ocular conjunctiva. Vision was reduced to counting fingers at one metre. Corvasymton was instilled every hour. No undermining was done. The corneae gradually acquired their normal brightness and the patient was discharged after 10 days.

Case 5

On September 8, 1952, a man aged 70 was admitted to hospital for a lime burn of the right eye. On examination the cornea was very hazy and vision was reduced to hand movements. The ocular conjunctiva was moderately swollen. The haziness of the cornea disappeared after two weeks. But there was a tiny persistent staining spot at 7 o'clock just within the limbus. When the patient was discharged after six weeks the cornea was clear except for a small dense opacity corresponding to the staining spot. The fornix was free.

Discussion

Corvasymton is an oxyphenyl-methylaminoethanol tartrate solution. It is related to "sympatol," which is closely allied to adrenaline: dioxypheylmethylaminethanol. When corvasymton solution 10% is instilled into the eye, constriction of the vessels follows, but the permeability is not altered. The intraocular tension does not show any change and there is no evidence of any toxic action.

The curative effect of corvasymton cannot be attributed to its vasoconstrictory action. Burns treated with adrenaline in any concentration do not show any improvement. On the contrary, if adrenaline is instilled in a concentration higher than 1:1,000 the condition of the eye is made worse.

It is thought that the beneficial effect of corvasymton is due to the adrenalone which it contains. Adrenalone is dioxypheylloxymethylaminoethanol

which is a keto form of adrenaline. It has been found (Loewi and Meyer, 1905; Dale, 1909) that adrenalone is much less toxic and has much less vasoconstrictory action than adrenaline. In solution of the latter the keto form of adrenalone is absent.

Besides the restoration of corneal transparency, the treatment of chemical burns of the eye has in view the prevention of adhesions between the conjunctiva and the ocular globe. As early as 1912 Denig removed the necrotic conjunctiva and replaced it by mucous membrane from the mouth. Thies (1928) again drew attention to the favourable effect of this treatment. However, in 1939, Passow noted that an oral mucosa graft was unnecessary, as the same results could be obtained by loosening up and undermining of the injured conjunctiva at the limbus corneae. In spite of its "necrotic" appearance, the conjunctiva is still capable of remarkable recovery.

In a chemical burn of the eye a deposit of the corroding agent is retained beneath the conjunctiva. Its gradual absorption, by impairing the nutrition of the sclera, cornea, and conjunctiva, gives rise to the well-known sequelae of chemical burns. By loosening up and undermining the conjunctiva at the limbus, the formation of a deposit is prevented and the subconjunctival tissue is laid open to the direct action of corvasymton.

I used to treat conjunctival and corneal chemical burns in the usual way—that is, by copious irrigation of saline solution or ammonium tartrate 10% solution; removal of all particles of the injurious material; frequent instillation of cod-liver oil, and insertion of a plastic contact glass to prevent formation of adhesions between raw surfaces. The most favourable cases took a long time to recover, and a completely clear cornea was an unusual result. In severe cases corneal opacities and wide adhesions were inevitable sequelae of the use of the contact glass.

I never had the opportunity to use tolazoline hydrochloride, which is a hyperaemia-inducing preparation recommended by Nagy (1951), nor transplantation of the oral mucosa (Denig-Thies operation).

The quick disappearance of the chemosis and the complete clarification of the corneal cloudiness and opacities which follow upon the frequent instillation of corvasymton, coupled with free loosening and undermining of the conjunctiva, are

so impressive that this preparation may be regarded as a very important asset in the treatment of lime burns of the eye.

REFERENCES

- Dale, H. H. (1909). *J. Physiol.*, 39, 55.
Denig, R. (1912). *Münch. med. Wschr.*, 59, 579.
Fischer, F. P., Hodgson, L., and Wagenaar, J. W. (1950). *Ophthalmologica, Basel*, 119, 257.
Loewi, O., and Meyer, H. (1905). *Arch. exp. Path. Pharmacol.*, 53, 213.
Nagy, F. (1951). *Ophthalmologica, Basel*, 121, 345.
Passow, A. (1939). *Klin. Mbl. Augenheilk.*, 102, 431.
Thies, O. (1928). *v. Graefes Arch. Ophthalmol.*, 120, 689.
Wagenaar, J. W. (1952). *Brit. J. Ophthalmol.*, 36, 202.

POLIOMYELITIS IN CHILDREN UNDER 6 MONTHS IN ENGLAND AND WALES DURING 1950

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Logan (1952) in his report on the distribution of poliomyelitis in England and Wales in 1950 stated that 82 cases of poliomyelitis were notified in children under the age of 6 months.

In correspondence with the medical officers of the districts in which these 82 cases occurred we found that in fact 5 were over 6 months old. Of these 2 were non-paralytic and 3 were paralytic. On the other hand, we were given information of 5 children who developed poliomyelitis during 1950 and were under the age of 6 months, but who were not included in Logan's figures. These 5 children had a paralytic attack. We have excluded the 5 children who were over 6 months of age and included the 5 referred to above. It is on this revised list of 82 cases that we are reporting the results of our investigation.

Logan's figures show that of the 82 cases that were notified in children under 6 months 72 were paralytic and 10 were non-paralytic. Our follow-up of the revised list of cases shows that 77 were paralytic (including the fatal cases) and 5 non-paralytic.

Our primary object was to consider: (1) the incidence of poliomyelitis in children under the age of 6 months; (2) its fatality, severity, and the extent of recovery; and (3) whether breast-feeding had any effect in preventing poliomyelitis.

Incidence

The incidence of poliomyelitis in children under 6 months of age was of particular interest to us in connexion with immunization against diphtheria, either alone or combined with a vaccine against whooping-cough; for Bousfield (1951) had suggested in 1951 that if children received their immunization earlier in infancy they would run less risk of contracting that type of paralytic poliomyelitis which is associated with immunization. It was assumed that this suggestion was based on the supposed infrequency of poliomyelitis in children under this age.

In children under 15 the total number of notifications of paralytic poliomyelitis in 1950 was 3,799. The number of children under 6 months per 1,000 children under 15 in 1950 was 35.8. The expected number of notifications in children under 6 months would therefore have been $35.8 \times 3,799 = 136$. There were in fact 77 cases according to our investigations.