and need only project from the stopper half an inch, and the other for the irrigation tube, which is bent at an obtuse angle outside and penetrates only for about a quarter of an inch beyond the stopper inside the bottle. The eyewash-bottle is used by turning it upside down and flushing the eye by gravity flow. Any attempt to modify the bottle so that it may be used like a wash-bottle in a chemical laboratory, by mouth-blowing, must be forbidden. It may be injurious.

If a man gets caustic soda in the eye, first aid must be given without delay: for this reason every man should be provided with a whistle to summon aid if necessary. Delay may lose an eye. The first-aider must take a wash-bottle from the nearest cupboard and, parting the eyelids with the finger, flush the eye with the contents of the bottle. The patient should then be taken at once to the plant surgery, which should be close to the caustic-soda plant and preferably with a laboratory adjacent, as this will ensure that a man trained in ambulance work is always available. About four specially trained men must be available on every shift, to give treatment in the plant surgery. Two of them must have instructions to leave their job and attend to the injured man immediately. He should be placed flat on his back on a couch, the foot of which is raised slightly. The eye must be irrigated continuously for one hour by the clock, with which the plant surgery must be provided. Irrigation must be performed for the first five minutes with 5% ammonium chloride solution, and for the rest of the hour with boric-saline solution, prepared as described below. During the irrigation care must be taken to pull the lower eyelid down gently so that the irrigation may reach the inferior fornix; and the injured man should be told to roll his eye from side to side so that the conjunctiva of the inner and outer corners of the eye may be reached. The upper eyelid should be gently elevated by the fingers of the first-aider, and the patient told to turn the eyeball downwards periodically so that the conjunctiva of the upper fornix may be reached.

This irrigation of one hour's duration is of supreme importance, and must be started at once. To send a case to hospital without such preliminary irrigation confronts the hospital with damage which is irreparable and which could have been prevented at the time of the accident by the measure described. In practice this treatment has reduced the time of recovery of caustic soda burns of the eye from weeks to days.

If the case is to be attended to by the works doctor he will see the patient every day and will instruct the ambulance-room attendant to irrigate the eye with warm boric-saline for 5 or 10 minutes three or four times a day, afterwards passing a blunt-pointed glass rod loaded with soft boric ointment first of all between the upper eyelid and the eyeball and then between the lower lid and the eyeball. If this is done no case of symblepharon will ever occur. The doctor will use atropine drops, argyrol solution (20%), or hot fomentations where he considers these measures are indicated. We find it advisable to adopt the first two measures in all but the mildest cases. It will be necessary for one man to be responsible for the ammonium chloride irrigators and eyewash-bottles. He must inspect them every day and fill all those that have been used. The works doctor will occasionally examine these vessels to ascertain that this is being done. Pools of caustic soda liquid on the ground and leaking joints will of course not be tolerated by the engineer-in-charge. If they are, the works doctor should have something to say about it.

With us, the tannic acid solution is made up in winchesters of 2.5-litre capacity; the date is written on the label, and any that has not been used is replaced by fresh solution at the end of three months. It is a great advantage, too, that it should be ready for instant use: tablets dissolve slowly. The cost of renewal is negligible. The quantities used are:

Tannic acid	50.0 grammes
Mercuric chloride	1.25 "
Water	2.5 litres

The boric solution is kept in winchesters at double strength in order that it may be diluted with an equal quantity of warm water when it is to be used. One ounce of common salt and half an ounce of boric acid are dissolved in a winchester of distilled water. We have found it convenient to have this solution ready made up in winchesters for immediate use.

Saline by itself grows a mould. The addition of the boric acid prevents this happening.

Summary

Cases of contact of caustic soda with the skin are dealt with by immediate irrigation with 5% solution of ammonium chloride; by which means a burn is prevented if the irrigation is done within 30 to 40 seconds of contact.

If delay has resulted in a burn, its severity is very greatly lessened by irrigation with ammonium chloride solution.

Irrigation of the eye with 5% ammonium chloride solution, followed by irrigation with warm boric-saline lotion for one hour, reduces the severity of the eye injury to a very marked degree, so that recovery takes place in one-fifth to one-seventh the time taken with older methods.

Treatment by ammonium chloride solution must always be carried out by immersion, never by immersion in a static solution or by compresses.

Medical Memoranda

Notes on Treatment of Respirator Dermatitis

Since the publication of Petro's article on respirator dermatitis (*British Medical Journal*, 1942, 1, 631) 25 cases have been admitted to a certain military hospital. The first 13 cases were treated on lines similar to those laid down in that article—viz., using calamine lotion and liniment, Burow's solution, and various creams such as 1% ichthylol in zinc cream. In no case could the progress be described as satisfactory, and in order to reduce the number of days of hospital treatment other methods were adopted.

The most successful method was what I shall call the saline soak technique. In this series 12 cases were treated; every case was a severe affection, associated with vesiculation, weeping, and crusting. With few exceptions they responded dramatically to the use of normal saline soaks, similar to those for the treatment of burns. Very rapidly the crusts are removed, the weeping ceases, and epithelization occurs without delay.

DETAILS OF TECHNIQUE

A white lint mask covering all affected areas is soaked in normal saline and applied to the face areas and covered by jaconet. It is essential to keep the lint moist throughout; this can be done by pouring on normal saline at frequent intervals. If the lint should become dry it is vital to soak thoroughly before removing. It is advisable to remove the lint from the face four-hourly, and to renew, so as to remove crusts. In some cases the face returned to its normal condition in 24 hours, and in all cases there was a rapid improvement. When the weeping areas have epithelized either zinc cream or 1% ichthylol paste should be applied.

A typical example is illustrated in Pte. A., aged 18, who was admitted to hospital on Dec. 4, 1942, two weeks after he was called up, having worn his respirator for 10 minutes the week previously, and again for 30 minutes three days before admission. The rash appeared 24 hours before he was admitted. He was suffering from a typical respirator dermatitis, affecting the forehead, cheeks, chin, and tip of the nose, all areas being covered with golden crusts. This case was treated with normal saline soaks in the manner described; after 24 hours there was a marked improvement, all crusts having disappeared, leaving a clean raw area. Treatment was stopped after 48 hours and the condition was cured in three days. Not all cases clear so dramatically, and most require a little zinc cream following the saline.

COMMENT

All these cases were moderately severe, affecting the contact areas of the face—viz., frontal, malar, masseteric, mental, and submental areas, with occasional lesions on the nose. Some cases proved more resistant to treatment than that of Pte. A., but comparison with other methods shows a marked advance. Another point of importance in the treatment is the advisability of not performing any patch test with rubber from the face-piece of the patient's own respirator until the skin is settling down or even healed, as a number of cases were aggravated by so doing; and even in one case after the skin was thoroughly healed the patch test caused relapse.

The saline technique seems to be the method of choice, and certainly takes precedence over those mentioned in the article quoted.

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