GAS AND ANTI-GAS PRECAUTIONS.*

(*Concluded from page* 192.)

THE TREATMENT OF CASUALTIES DUE TO BLISTERING AGENTS OR VESICANTS.

Mustard Gas.

The prevention of injury by mustard gas is more difficult than in the case of other types of war gases, because mustard gas attacks every portion of the body with which it comes into contact. Also, other gases advertise their presence immediately by their effects, *e.g.*, lachrymation, coughing or pain, but contact with mustard gas, in either liquid or vapour form, causes no immediate discomfort, and there is a delay of some hours before the onset of the symptoms. Splashes of liquid in the eyes are an exception to this rule; but even in this case, after the first irritation has subsided, there is a delay of about one hour before the injurious effects are fully apparent. Because of this delayed action it is probable that cases will come to the first aid centres, or will return after previous decontamination treatment which has been applied too late.

Mustard gas readily penetrates the skin and other tissues, and immediately begins to exert its action though the patient may not be aware of it until the injury has proceeded far enough to give rise to symptoms.

The eyes are the most vulnerable part of the body, the lungs and breathing passages come next, and, lastly, the skin. Moist and greasy skin is more readily affected than parts which are dry.

The sequence of events following exposure to mustard gas vapour is as follows:—

Within about six hours the patient's eyes begin to get sore and the soreness increases until the sensation may even suggest the presence of grit in the eyes. This is accompanied by a flow of tears and spasm of the eyelids. About the same time there is a discharge from the nose, as in the early stages of a common cold. The eyes and eyelids then become swollen, and discharge oozes between the lids, so that in a short time the patient is unable to see. The pain in the eyes is severe and accompanied by headache. The patient by this time may have developed soreness in the throat, accompanied by a dry harsh cough, and may also complain of pain in the stomach, and may vomit. About this time skin burns may appear. At first these show themselves as a diffuse reddening which is often accompanied by intolerable itching. In a mild case nothing more may happen; but in a severe case small blebs soon begin to show themselves in the reddened areas and eventually join together to form large blisters. These symptoms normally increase in intensity during the first 24 hours. If much of the vapour has been breathed acute bronchitis will now set in.

In the most severe cases of burns caused by vapour or by exposure to liquid mustard gas, the skin becomes a bluish colour, and the bluish areas later break down to form ulcerated surfaces which are very slow in healing.

Should a large drop of mustard gas fall into the eye, it will cause intense irritation and spasm of the eye, but it is possible that small drops may enter the eyes and cause no immediate symptoms. If contamination of the eyes is suspected immediate treatment is imperative.

It should be noted that mustard gas casualties almost invariably recover completely with proper treatment, and the death rate is extremely low, except when severe secondary infection of the lung injuries occurs.

Treatment.—The treatment which can be applied by first aid personnel will be principally of a preventive or palliative nature.

The first essential is to get rid of all contamination without delay.

When it is known that the eyes have been exposed to vapour, they should be carefully washed with a solution of, normal saline (one teaspoonful of salt to a pint of water) or if this is not available, with plain water.

In the case of liquid drops of mustard in the eyes this washing should be done at once. After the washing, a drop or two of liquid medicinal paraffin or castor oil should be instilled between the eyelids to prevent them sticking. Great care should be taken not to rub the surface of the eye, or to apply a bandage. An eye-shade is permissible.

For practical reasons it is important to recognise the difference between the effects produced on the eyes by "tear gases" and by "blistering gases." In the case of "tear gases" the person affected is for the moment blinded by his own tears and by his natural instinct to close his eyes to minimise the irritation: he may require assistance to get away from the poisonous air, but that is all, for in pure air the effects will quickly pass away. In the case of a "blistering gas" like mustard gas the inflammation comes on slowly, but when once it has become established it lasts for some time, and perhaps for a day or two the sufferer will be quite unable to see on account of the swelling of the eyelids and the inflammation of the surface of the eye. In the event of a mustard gas attack on a large town some persons who have actually been exposed to the gas may, owing to local conditions, be unable to obtain treatment before the inflammation of the eyes has become severe. If for that reason they can no longer see, they must be treated like blind persons and conducted to the decontamination centre, the hospital, or their homes, as the case may be. The first aid personnel must be prepared to give their assistance in such cases, and it need only be pointed out that if this type of casualty is numerous it is possible to collect a small number of them into a party, each man holding on to his neighbour, and all being led by a single guide.

Patients who are suffering from mustard gas injuries which have already developed, should receive treatment by a medical practitioner without delay. Pending such attention, blisters should be covered with clean dressings, and an endeavour should be made to prevent them from bursting until they can be treated by proper surgical means.

Lewisite.

Lewisite produces burns very similar to those caused by mustard gas, but as it contains arsenic, symptoms of arsenical poisoning may also occur in some cases. The delay in appearance of the symptoms is not so long as with mustard gas. Erythema, or reddening of the skin, may appear within 20 minutes of the contamination of the skin by the liquid.

The injuries should be treated on the same lines as those laid down for mustard gas burns, and medical attention secured as quickly as possible.

THE TREATMENT OF CASUALTIES CAUSED BY POISONOUS GASES AND CHEMICAL SUBSTANCES NOT USED FOR OFFENSIVE PURPOSES.

The gases dealt with in this section are not used as offensive agents, but are liable to be encountered under peace or war conditions.

Carbon Monoxide.

This gas is produced when certain materials burn under circumstances in which the supply of air or oxygen is restricted. It is one of the gases liberated in the explosion of high explosives, it is given off in the exhaust gases of motor engines, and a considerable proportion is present in ordinary coal gas. It forms the deadly constituent in the so-called "after-damp" which is formed in a colliery explosion.

* *This series of articles is taken from Air Raid Precautions Handbook No. 2, issued by the Home Office.*—ED.

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