

relationship between the patient and a particular doctor, with more widely publicized descriptions of the cases, would appear to be the best form of management at present. Sporadic instances of attempted treatment along these lines have in the past met with some success—that is, if keeping these people out of hospital, without, unfortunately, changing their behaviour, can be called successful management.

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## POISONING DUE TO SODIUM FLUOROACETATE ("1080")

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A BOY, aged eight years, was admitted to hospital in status epilepticus following ingestion of sodium fluoroacetate ("1080"). Subsequently, he was resuscitated from cardiac arrest, but was left with severe neurological impairment. This widely-used agricultural poison is cardiotoxic and neurotoxic, and stringent precautions exist to control its use.

#### CLINICAL RECORD

The patient was admitted to the intensive care unit of the North-Western General Hospital, Burnie. He had been playing in a farm shed and had chewed some wheat which had previously been impregnated with "1080" to poison rabbits. He vomited twice before admission and was admitted unconscious, having repeated generalized convulsions.

An endotracheal tube was inserted, he was given oxygen and his convulsions were controlled with intravenous administration of thiopentone sodium and diazepam. His electrocardiogram was monitored continuously. This showed marked sinus tachycardia, with a rate of 160 per minute.

However, 14 hours after his admission, he had sudden ventricular asystole. External massage, ventilation and sodium bicarbonate infusion were commenced, and after approximately ten minutes his heart commenced contracting again in marked sinus bradycardia. After the intravenous administration of isoprenaline, this was converted into sinus tachycardia.

During resuscitation, much blood-stained mucus was aspirated from the endotracheal tube, and later radiological signs of collapse and consolidation of the lower lobe of the left lung developed. The patient was oliguric for a few hours, but after intravenous administration of mannitol, his urine output improved. However, he remained unconscious, with unequal pupils, bilateral extensor plantar responses and generalized rigidity.

Four days later, the endotracheal tube was removed, a tracheostomy was performed, and feeding continued with a naso-gastric tube and "Complan".

Thereafter progress was slow. On the tenth day, he kept his eyes open and could appreciate some movement.

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However, marked hypertonicity of all limbs was present, particularly in the arms, with no spontaneous movements. He had frequent extensor spasms of his arms and legs, which were controlled with chlorpromazine and diazepam. The tracheostomy was closed, but tube feeding had to be continued for a further two weeks.

He was transferred to the rehabilitation division and has continued to make slow progress. He can swallow and has a good range of movements of the arms, but a moderate paresis remains in the legs. He recognizes familiar people and objects, and speech is almost normal, although a severe degree of mental defect is obvious and likely to remain.

#### DISCUSSION

Sodium fluoroacetate ("1080") is colourless and water soluble and is absorbed orally, by inhalation, or through cuts and abrasions. Its toxicity depends on the conversion to fluorocitric acid, which blocks the tricarboxylic acid cycle in the cells. Toxic effects occur within minutes to four or five hours after ingestion. The metabolic lesion manifests itself principally in disturbed activities of the central nervous system and of the heart.

It produces vomiting, convulsions, coma, respiratory depression and cardiac irregularities. Death is commonly due to ventricular fibrillation in man. This may be preceded by pulsus alternans, long sequences of ectopic beats and ventricular tachycardia.

The fatal dose for a man weighing 150 lb varies between 50 and 100 mg (Dreisback, 1966).

The poison is widely used for extermination of rabbits. It is mixed with bait, such as carrots, left in prepared furrows, and the area sealed off. Stock should be kept out of the area treated for four weeks, as the bait retains toxicity for long periods. In handling it, respiratory protection is necessary, as inhalation of the powder may occur; protective clothing should be worn and hands washed after using it.

The use of "1080" is normally restricted to officers of the Department of Agriculture, who have been specially informed of the dangers involved.

If the poison has been swallowed and the patient is conscious, gastric lavage should be carried out, but would need to be prompt.

Convulsions may need to be controlled with intravenous administration of barbiturates; cardiac monitoring is advised, with the use of antiarrhythmic drugs as indicated.

The intramuscular use of 0.25 ml of "Monoacetin" (glyceryl monoacetate) per kilogram of body weight is advised, with a repeat dose half an hour later and then at intervals as necessary. This has proved effective in experimental poisoning in monkeys (Chenoweth *et alii*, 1951) and reverses the cardiac irregularities.

Alternatively, if this is unavailable, the intravenous administration of 5% ethyl alcohol and 5% glucose in water, 200 ml/hour, should be commenced.

Neither of these antidotes has been subjected to clinical trial in man, and only commercial preparations of "Monoacetin" of uncertain purity are available.

In view of the widespread use of "1080", it is considered that pure glyceryl monoacetate suitable for parenteral use should be freely available.

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### Shorter Communications

#### ILLNESS FOLLOWING ACCIDENTAL SELF-INOCULATION OF BRUCELLA ABORTUS STRAIN 19 VACCINE

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THE VALUE of *Brucella abortus* strain 19 living vaccines in the control of contagious abortion in cattle is well recognized. Strain 19 is an attenuated strain which is relatively avirulent to cattle and to man.

Not all workers are agreed, however, that the vaccine is completely harmless to humans (Spink, 1964). Although there is no evidence that strain 19 can cause disease in man by natural spread, namely, direct contact, or ingestion of milk from vaccinated animals, cases of illness are known to have occurred among veterinary surgeons after accidental self-inoculation of the vaccine during routine vaccination of calves (Spink and Thompson, 1953; Spink, 1957; Joff and Diamond, 1966; Pivnick *et alii*, 1966; Harvey, 1969). This type of accident, which is not uncommon, is likely to take place when an inadequately restrained animal gives a sudden jerk during the vaccination procedure. It is important that veterinary surgeons and medical practitioners are aware of this hazard, in order that appropriate medical treatment may be instituted without delay, should such a mishap occur.

The development of brucella hypersensitivity (tuberculin-type bacterial allergy) is an established feature of human brucellosis (Spink, 1964). Persons who have been infected clinically or subclinically in the past are usually hypersensitive to the brucella antigen and will react accordingly

when exposed again to the organism. It has been observed (Spink, 1969) that after accidental introduction of strain 19 vaccine into the tissues of a non-sensitive person, there is usually a latent period of several days before symptoms of a transient, mild febrile illness appear. Rarely, the illness may be of a more severe nature. The treatment in these cases is the same as for acute brucellosis, namely, antibiotic therapy with tetracycline and streptomycin. More commonly, a troublesome type of illness occurs in brucella-sensitive persons after accidental self-inoculation of strain 19 vaccine. It takes only a few hours before a severe local hypersensitive reaction (pain, redness and swelling) develops, followed by chills and fever. The general signs and symptoms usually subside in one or two days, but the local reaction may be so massive as to interfere with the local blood supply, resulting in necrosis and loss of tissue in the particular area. Combined corticosteroid-antibiotic therapy (prednisone and tetracycline) has been used successfully in such cases (McCullough, 1963; Joff and Diamond, 1966). When the local allergic reaction is very severe, the corticosteroid may have to be given parenterally.

McCullough (1963) recommends that veterinary surgeons and others who handle strain 19 should be regularly screened for their hypersensitivity status by skin tests using dilutions of brucella antigen (such as a graded brucellin skin test) and have serum agglutination titres estimated periodically. The information from these tests