MEDICAL MEMORANDA

Cutaneous Necrosis Due to Cetrimide Application

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Reports of necrosis caused by quaternary ammonium compounds, such as cetrimide, are rare. The case is reported of a 77-year-old woman who was admitted to hospital for four months with cutaneous necrosis of the left foot and leg owing to the topical application of cetrimide powder.

Case Report

In April 1973 the patient attended her general practitioner with some eczema on the left pretibial area, which was treated with topical steroids. By July 1973 healing was proceeding satisfactorily, but two weeks later secondary infection developed. This was treated without benefit by Eusol and paraffin. Daily dressings with neat, pure cetrimide powder (B.P.C.) under Melolin non-adhesive dressings held on by a bandage were then undertaken from 15 August until admission on 3 September. The rationale was that a powder with antiseptic properties would both dry the lesion and deal with secondary infection.

On examination there was a green and brown slough of coagulation necrosis extending from the dorsum of the left foot to just below the knee (see photograph). The lesion was odourless and not particularly painful. Sensation in the toes was normal, as were ankle and toe movements. Peripheral pulses were present and the toes were warm.

Investigations.—Repeated bacteriological swabs were sterile, but later secondary infection with *Staphylococcus aureus* developed. The haemoglobin was 9.6 g/dl, reflecting nutritional anaemia with deficiencies of iron, folate, and vitamin B₁₂. She was patch tested with the standard series of reagents proposed by the International Contact Dermatitis Research Group but the results were negative. Patch tests to benzalkonium 1/1000, cetrimide 1/1000, diphenhydramine, T.C.P., and Dettol also gave negative results.

Course and Treatment.—Her leg healed over four months after debridement and soaks with potassium permanganate and eusol and paraffin. A bout of secondary infection responded to cloxacillin, and the nutritional anaemia responded to haematinics. The leg remained healed after discharge from hospital in December 1973.

Comment

Cetrimide (Cetavlon) is a quaternary ammonium compound consisting of a mixture of alkyltrimethylammonium bromides. It is widely used as a sterilizing and detergent fluid, for skin antiseptics, for shampooing the hair, and for instrument cleaning. A related mixture, benzalkonium, is similarly used and can also be used as an algacide in swimming pools, to clean cow sheds and chemical toilets, and as a transport medium for contact lenses. Such uses reflect the antiseptic and detergent properties of quaternary ammonium compounds. These are usually well tolerated by the skin and few reports exist of true allergic contact dermatitis (Huriez *et al.*, 1965).

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Slough of coagulation necrosis from dorsum of left foot to just below knee.

Reports of necrosis caused by quaternary ammonium agents are even more unusual. Necrosis of the foreskin and the vulval area after the topical application of 1% dequalinium has been reported (Coles and Wilkinson 1965; Tilsley and Wilkinson 1965). Occlusion seemed to be the main factor in this necrosis, whose sporadic occurrence puzzled the authors. Another report (Gerstl, 1964) concerned small areas of dermal necrosis which occurred at the site of a bacillus Calmette-Guérin vaccine injection when syringes were sterilized by soaking in 1% benzalkonium. Experiments showed that 1% solutions of benzalkonium produced necrosis when injected into the dermis while the subcutaneous tissues tolerated this material. I have seen necrosis at the site of a patch test using 2% cetrimide. In the leg necrosis of the patient reported here there was, likewise, an irritant necrotic effect with no evidence of allergic contact dermatitis. Fortunately, she experienced no systemic toxicity from an application of cetrimide. There are reports of depression of the central nervous system, epilepsy, and sudden death after the ingestion of small amounts of quaternary ammonium compounds either by accident or after an enema (Todd, 1967).

Cetrimide is available over the counter at any chemist in powder form. Perhaps the lesson is that this material needs a more emphatic warning about application using the appropriate concentrations.

This case was demonstrated at the dermatology section of the Royal Society of Medicine on 18 April 1974 and is reported by kind permission of the editor of the *Proceedings*.

References

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