SHORT REPORTS

Cetrimide allergy presenting as suspected non-accidental injury

Suspected non-accidental injury is becoming a more frequent paediatric diagnosis in Britain. I describe a case of presumed non-accidental injury that proved to be an allergic response to cetrimide (12% solution), a commonly prescribed preparation.

Case report

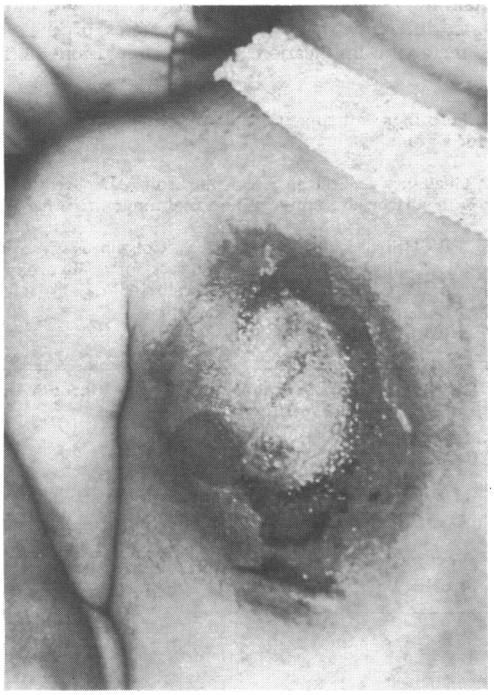
A 20-month-old boy was admitted to the paediatric ward after presenting to casualty with a large burn on the right pectoral area (figure). He was the product of a normal pregnancy and there was no history of note except a head injury sustained at 15 months. There was no history of allergy. He came from an unstable family background, the mother being unmarried and cohabiting with a man who was not his father.

In the early hours of the morning of admission he had woken screaming, having previously been well. Six hours later a general practitioner had been called to see the child but had found no reason for his behaviour. During the subsequent 10 hours an area of erythema 14 × 8 cm, including a central area of blistering with bullae formation, developed on the right chest wall. He presented in the accident and emergency department and was admitted. Because no explanation was forthcoming possible non-accidental injury was diagnosed and a case conference called.

Investigation by the police and social services concluded the lesion to be accidental in origin. Exhaustive inquiry established that shampoo containing cetrimide 12% had been spilled on to the child's chest, while he was unattended, on the eve of admission.

A control experiment was performed, with the mother's consent, and a small quantity of cetrimide (12% solution) was applied to the left chest. This produced a lesion identical with the first.

Both lesions were treated with silver sulphadiazine ointment, 'N' for Burns, and non-adhesive dressings. He made good cosmetic recovery.



Burn caused by allergic response to cetrimide.

Comment

Cetrimide is a quaternary ammonium compound. These are common constituents of many sterilising and detergent fluids for skin antisepsis, shampooing hair, and cleaning instruments. They are usually well tolerated, and few reports exist of true allergic contact dermatitis.[1-3] Indeed, the appearance of this lesion was that of a primary local irritant reaction. In many cases occlusion seems to be the main factor.[4]

This case was particularly fraught in view of the emotional and medicolegal implications for all concerned. Some weeks after discharge the parents alleged in a solicitor's letter that the second burn had been caused without consent. The matter had been fully documented in the notes, and the allegation was therefore refuted completely. Thus the importance of full, impartial, and prompt investigation and documentation of all similar cases cannot be overemphasised, and we are reminded of the potential hazards of commonly used pharmaceutical and domestic preparations.

I thank Dr D M Morgan, consultant paediatrician, Airedale General Hospital, Steeton.

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Pruritus after administration of hetastarch

Hetastarch (hydroxyethyl starch) is widely used as a sedimenting agent to increase yields of granulocytes during leucapheresis. We report four cases in which severe pruritus occurred after administration of hetastarch, causing considerable discomfort to the previously healthy volunteer donors. The pruritus lasted for three to six months.

Case reports

Severe pruritus developed in four healthy male donors (including three of us) shortly after they had given granulocytes on an IBM cell separator. The cases occurred at three different centres over a four-month period. As part of the procedure the donors received hetastarch as a 6% solution (Plasmasteril). One donor received one litre over two successive days, the others two litres over seven days; all donated granulocytes on two or three occasions. Two of the donors received hydrocortisone 200 mg intravenously immediately before donation. None had a history of allergy.

The donors developed itching some two weeks after the procedure. The itching was generalised or worse in the perineal region. It was exacerbated by warm water, exercise, scratching, or rubbing with towels. Cold water and cool lotions were soothing. The itching was extremely uncomfortable and socially embarrassing. There were no visible skin changes, and the itching subsided slowly over three to six months. One donor subsequently received a further 500 ml infusion of hetastarch when donating granulocytes but experienced only a short-lived and less severe recurrence of symptoms. At the time of this donation, six months after the initial occasion, the itching had settled and the association with leucapheresis had not been made.

Comment

Sedimenting agents increase the yield of granulocytes, and hetastarch seemed particularly suited for this purpose because it was thought not to be antigenic in man.[1] Few major problems have been associated with its use, although a case of lichen planus was recently reported in a donor exposed to it.[2]

We believe that the hetastarch used during leucapheresis was responsible for the itching in our cases. We recognise that other causes—for example, leaching of plasticisers from the equipment—are possible, but they are less likely since itching has occurred only after granulocyte collection and has not affected patients receiving regular plasma exchanges without hetastarch.

Hetastarch is excreted by the kidneys and is also taken up into the reticuloendothelial system. It is an alarmingly persistent substance

and may be detected in the circulation many weeks after infusion.[3] This long intravascular life is certainly undesirable and particularly so when the agent is used in healthy volunteer donors. The prolonged circulation of hetastarch may well have contributed to the extraordinary persistence of the pruritus in our cases. We believe that less persistent agents should be used: dextran 70 would be suitable but might increase the risk of anaphylaxis or, alternatively, hetastarch might be modified to increase the speed at which it is degraded.[4]

Pruritus appears to occur only in those donors who have received more than one litre of hetastarch within a short time. We would suggest that, if a donor is to give granulocytes on more than one day in any week, a formula devised to reduce the exposure to hetastarch should be used. Mischler[5] recommended a regimen of 500 ml on day one, 300 ml on day two, and 200 ml on day three, or a dose based on the donor's erythrocyte sedimentation rate after previous administration of hetastarch.

It is important to highlight this problem so that volunteer donors may be made aware of possible consequences of donating granulocytes. We noted that the donors were reluctant to attribute the itching to the procedure, even when they were doctors. We expect that many similar cases will be found once this problem is made known.

The Committee on Safety of Medicines and the distributor have had no other reports of this side effect of hydroxyethyl starch.

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Serum 25-hydroxy vitamin D in coalworkers and surface workers in winter

In a previous study[1] we found that serum 25-hydroxy vitamin D (25-OHD) concentrations were similar in surface and underground coalworkers and non-miners and concluded that the solar irradiation to which underground workers were exposed between shifts was adequate to maintain vitamin D synthesis in the skin. Since the observations were made in the summer months, when ultraviolet radiation would have been at its greatest, we thought it important to do a similar study in the winter.

Subjects, methods, and results

Serum 25-OHD concentration was measured in 60 underground and 28 surface coalworkers working various shifts (see table). Of the surface workers, 13 either had recently retired or were temporarily off work for minor disabilities. The sera had all been taken in November and December 1979 and March 1980 and had been stored at −70°C. For comparison sera were taken in January and February 1981 from a population of normal adult male day-workers not in the coal industry. Serum 25-OHD concentration was measured by competitive protein binding.[2] Analysis of fresh sera and sera frozen to −70°C showed that the collection and storage procedures were unlikely to have produced an error of measurement.

The table shows no significant difference in 25-OHD concentrations in sera collected in the winter months from surface and underground coalworkers and from normal subjects not working in the coal industry. The mean concentration in all subjects (n = 124) was 59·6 ± SE 2·0 nmol/l (23·8 ± 0·8 ng/ml), which is significantly lower ($p < 0.05$) than the mean concentration of 73·8 ± 4·9 nmol/l (29·5 ± 2·0 ng/ml) found in the 139 comparable subjects studied in the summer months.[1] This difference between summer and winter was apparent in both non-miners and miners whether they were working above or below ground.

Comment

The present study shows that there was no difference between serum 25-OHD concentrations in underground and surface miners and other surface workers in the winter months, as was found in a similar study undertaken in the summer months.[1] The higher values found in miners and other workers in the summer months compared with the winter are in keeping with the suggestion that in the summer sufficient ultraviolet light is obtained by underground workers between shifts to maintain vitamin D synthesis in the skin.[1] During the winter months, however, miners working underground are exposed to only small amounts of solar ultraviolet irradiation between shifts. Thus, while we may conclude that coalminers working underground are not short of vitamin D, blood concentrations of this vitamin may be maintained in different ways at different times of the year. The dietary and metabolic implications of this conclusion merit further study.

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Serum 25-OHD concentrations in coalminers and other workers (nmol/l)

	Coalminers								
	Underground shift				Surface shift		Totals		
	0800-1600	1300-2100	2200-0600	0600-1400	0600-1400	Others*	Underground	Surface	Non-miners
Mean	59·68	53·6	56·45	59·55	63·87	61·13	58·5	62·6	59·2
SE	10·85	18·18	5·65	4·1	6·05	5·63	3·15	4·1	2·45
SD	28·7	20·68	12·63	25·88	23·43	20·33	24·33	21·68	16·9
n	7	8	5	40	15	13	60	28	36

*Off work for minor complaints or recently retired.
Conversion: SI to traditional units—125-OHD: 1 nmol/l ≈ 0·4 ng/ml.