the anterolateral aspect of the right thigh of 3% body surface area. The skin was erythematous and oedematous but not blistering and was treated conservatively. The wound healed within three weeks, and he was discharged with no further treatment.

Comment

Industrial and domestic use of liquid propane is increasing. Liquid propane is volatile; the boiling point at atmospheric pressure is -44°C . The gas is usually transported as a liquid under pressure at -64°C . The catastrophic consequences of igniting liquid propane have been reported.¹ Injuries occasionally occur in the industry, but injuries from direct contact with propane are rarely seen. Spraying liquid propane on to the skin usually causes cold injury. Hicks *et al* showed that spraying the skin with propane for 12 seconds caused epidermal necrosis in animals.² Spraying for 30 seconds caused dermal necrosis 24 hours later, and damage to the superficial muscle was seen five days later. The tissue freezes, which leads to cell damage and vascular thrombosis—similar to frostbite but more rapid with propane.

Our two patients had what looked like a thermal injury, where the tissue feels warm and does not have to be warmed slowly as in prolonged exposure to cold. Neither patient had evidence of "frosting," and the appearance was similar to a scald.

Spilling liquid propane directly on the skin caused deep necrosis in the first patient. The liquid propane vapourised on the warm tissues, causing rapid cooling of the surrounding tissue and resulting in a deeper injury than propane gas caused in the second patient. He was also protected by two layers of clothing. Initially, skin loss in both patients seemed to be superficial.

Liquid propane is now used as a fuel for domestic heating systems, cars, camping, and caravanning. By law, containers for transporting liquid propane carry warnings of explosion but no warning of the danger of direct contact.

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Liquid crystal thermography and C reactive protein in the detection of deep venous thrombosis

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Deep venous thrombosis is a common problem which is difficult to diagnose reliably on clinical grounds and usually requires phlebography to establish the diagnosis. The concept of a simple, quick screening test which could effectively exclude the possibility of a deep venous thrombosis is appealing. Infrared thermography¹ and iodine-125 and labelled fibrinogen venoscanning² have a high sensitivity but poor specificity and would be potential candidates except that they require specialised, expensive equipment which is not readily available. More recently liquid crystal thermography has been employed, which uses simple, portable equipment.³ In a consecutive series of patients suspected of having deep venous thrombosis we examined the accuracy of liquid crystal thermography and measurement of the C reactive protein concentration compared with phlebography.

Patients, methods, and results

We studied 78 patients (36 male, 42 female) with a mean age of 58 years (range 10-90) clinically suspected of having deep venous thrombosis. They were first examined by liquid crystal thermography and the result recorded before proceeding to phlebography. After the first 31 patients had been examined in this way subsequent patients also had blood withdrawn before the injection of contrast for estimation of the C reactive protein concentration.

Liquid crystal thermography was performed with a series of latex contact sheets containing organic ester derivatives which respond to different temperatures by emitting visible light of varying wavelengths and therefore different colours.⁴ Phlebography was performed in the usual way by using non-ionic contrast medium. C Reactive protein was assayed by radial immuno-

diffusion. The defined upper limit of the normal concentration is $<10\text{ mg/l}$.

Comparing the results of liquid crystal thermography with phlebography yielded 47 positive thermograms including 20 which were false positive. The thermograms were negative in 31 patients, of which five were false negative. Liquid crystal thermography therefore had a sensitivity of 84% (95% confidence interval 72% to 96%) and a specificity of 57% (42% to 70%) in detecting deep venous thrombosis.

There were 47 patients who were examined by liquid crystal thermography who also had their C reactive protein concentration measured before phlebography. In 32 cases the concentration was raised, and in 14 of these the phlebogram was normal. In all but two of these patients there was an alternative explanation for the raised C reactive protein value. The 15 patients with normal C reactive protein concentrations all had normal phlebograms. There were no false negative C reactive protein estimations. The C reactive protein concentration therefore had a sensitivity of 100% (95% confidence interval 78% to 100%) and a specificity of 52% (34% to 70%) in detecting deep venous thrombosis.

Comment

The management of suspected deep venous thrombosis is a recurrent problem, and a simple screening test to decide which patients should have more complicated, painful, and expensive examinations would be useful. We had hoped that the portable liquid crystal thermography unit would fulfil this role.³ We found, however, that its sensitivity was too low with too many false negative results.

C Reactive protein is a sensitive and reliable acute phase protein whose concentration can now be estimated rapidly and cheaply. Its concentration in plasma increases within six to eight hours after an inflammatory stimulus, peaking at around 48 hours before falling to normal with a half life of about 48 hours.⁵ In the presence of inflammatory complications such as infection the expected fall on the third postoperative day does not occur. Steroids, oestrogens, and pregnancy have no effect on its concentration. Some diseases, such as the connective tissue diseases, osteoarthritis, and ulcerative colitis, also lack an acute phase response.

From our small series of patients measuring the C reactive protein concentration seems to provide a highly sensitive and inexpensive screening test which is simple and quick to perform. A normal result in our study excluded a deep venous thrombosis.

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Completeness of registration of childhood leukaemia near nuclear installations and elsewhere in the Oxford region

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The rates reported for childhood leukaemia are higher in areas around nuclear installations than in other areas. The incidence of leukaemia in children who live near nuclear installations is usually compared with that for England and Wales or for the region.^{1,2} It has been suggested that the higher rates reflect more complete registration of cases in areas around installations than elsewhere. To find out whether this affects the reported incidence we need to know whether the published rates for England and Wales or for one region reflect the true incidence of childhood leukaemia.

The districts of West Berkshire and of Basingstoke and North Hampshire either include or are close to the Atomic Weapons Research Establishment at Aldermaston, the Royal Ordnance Factory at Burghfield, and the UK Atomic Energy Authority's establishment at Harwell. Roman *et al* found that during 1972-85 the number of cases of childhood leukaemia registered in electoral wards within 10 km of the installations was 40% higher than expected from national registration rates, the number of cases in the remaining wards of the two local health districts was only 20% higher, and the number in the rest of the Oxford and Wessex regions combined was nearly the same as the number expected.³

Patients, methods, and results

We attempted to find out how complete the registration of cases was in one region. We asked consultant paediatricians at the main hospitals in the Oxford region to compile lists of children from hospital and department records who were treated for leukaemia in 1972-85. We compared these names with those in the National Registry of Childhood Tumours, which is derived from notifications to all regional cancer registries. We excluded data on children treated at the Royal Berkshire Hospital, which was the nearest hospital with a paediatric oncology clinic to two installations, because Roman *et al* previously reported that all the children treated at this hospital in 1972-82 who were residents in the Oxford Regional Health Authority were in the national registry³ and we wished to compare the practice of registration in the area near the installations with the practice elsewhere.

Consultants at hospitals in Amersham, High Wycombe, Banbury, Kettering, Milton Keynes, Northampton, Oxford, and Stoke Mandeville provided lists from which we identified 144 children aged under 15 years who had had a diagnosis of leukaemia during

1972-84. These children were classified by region of registration and of residence as recorded in the national registry (table). A total of 137 (95%) children were in

*Region where children with leukaemia lived and where their diagnosis was registered, 1972-84**

Region of residence	Region where registered		Not registered	Total
	Oxford	Other		
Oxford	115	4	6	125
Other	15	3	1	19
Total	130	7	7	144

*Data in the National Registry of Childhood Tumours for 1985 were incomplete at the time of the study.

the national registry. Among the 125 children who lived in the Oxford region, 119 (95%) were in the national register, including four who were registered only in another region. Six children from the Oxford region were not registered.

Comment

Roman *et al* studied cases of leukaemia in children resident in the area of the study that had been recorded in the national registry. They were able to confirm the completeness of registration only for cases diagnosed in 1972-82. This showed that 72 of the 76 (95%) cases that had come to their notice from their own records, other local records, and the national registry had been registered. Clearly, therefore, completeness of registration in the area of their study was no better than in other parts of the Oxford region for which we obtained information. This covered about 60% of all cases registered in the region outside the West Berkshire district.

We conclude that registration bias is unlikely to account for the excess incidence of childhood leukaemia in the vicinity of three nuclear installations as reported by Roman *et al*.³

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