plexes suggests their responsibility in the recurrence of pulmonary haemorrhage.

The origin and nature of these immune complexes remain unknown. They may be composed of basal membrane antigens and the corresponding antibodies or they may result from an intercurrent immunological attack of some sort. Our findings emphasise the importance of assaying for immune complexes in patients with Goodpasture's syndrome who suffer recurrences of pulmonary haemorrhages.

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Haemoperfusion for theophylline overdose

Self-poisoning with theophylline is becoming increasingly common, and probably reflects the introduction of sustained-release formulations and their extensive use. Helliwell and Berry[1] have drawn attention to the serious nature of such overdoses, noting that hypotension, cardiac arrhythmias, and hypokalaemia are associated with a high mortality while tachycardia, nausea, and vomiting, the early features of theophylline intoxication, are not universally present. Indeed, the severity of the overdose may be shown only when convulsions occur, and Zwillich[2] has noted that such a presentation carries a 50% mortality. Relatively small overdoses (1·5-4·0 g) from sustained-release formulations have caused severe symptoms, whose onset may be delayed up to 10 hours after ingestion. We report here such a patient who was successfully treated by charcoal haemoperfusion.

Case report

A 15-year-old girl (43 kg) who had been prescribed sustained-release theophylline (Phyllocontin) 225 mg twice a day ingested 1·575 g of theophylline (seven tablets) as a result of personal stress. The ingested dose was confirmed by a count of the remaining tablets. Gastric lavage two hours after ingestion produced only a small amount of tablet debris. She remained deceptively well for 10 hours before the sudden onset of hypotension and tachycardia, followed by a cardiorespiratory arrest. After resuscitation she had a profound acidosis, hypokalaemia, and cardiac arrhythmias, notably ventricular tachycardia and supraventricular tachycardia.

The theophylline concentration measured 16 hours after ingestion was 146 mg/l (therapeutic range 5-15 mg/l). In view of this high level, her clinical deterioration, and the onset of frequent convulsions, she was transferred to Guy's Hospital for further management. Haemoperfusion was initiated with a charcoal column (DHP-1 Hydron Haemoperfusion Cartridge, Kuraray Co Ltd, Japan) and continued for three hours, reducing the theophylline level to 31 mg/l. Analysis performed eight hours after the end of haemoperfusion showed that there had been no rebound in the drug level. Her recovery was delayed because of chest complications, including an aspiration pneumonia which had followed the cardiorespiratory arrest. Peritoneal dialysis and then haemodialysis were required for acute renal failure, presumed to be secondary to the profound hypotension.

Comment

There are two American single case reports[3 4] of charcoal haemoperfusion being used successfully to manage theophylline overdose In our patient the mean drug clearance was 97 ml/min and the average flow rate through the column 140 ml/min. During 170 minutes of haemoperfusion the venous theophylline concentration was reduced from 120 mg/l to 31 mg/l, and we calculate that 920 mg of theophylline (58% of the stated ingested dose) was cleared from the blood.

This case illustrates the serious nature of theophylline overdose and the value of measuring the plasma concentration early. Relatively small doses, particularly of the sustained-release preparations, seem to produce serious complications. An additional factor may be concurrent therapeutic administration of theophylline, as in our patient. Our results suggest that haemoperfusion may be of value for severely intoxicated patients and should be considered early as a form of treatment in those who show signs of clinical deterioration in association with high plasma concentrations.

We thank the many doctors and nurses who were involved in the care of this patient.

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Anorexia nervosa in diabetes mellitus

Heightened awareness of carbohydrate consumption is a feature of both diabetes mellitus and anorexia nervosa. One authority has noted that the association of these relatively common conditions is surprisingly rare[1] and we have found only one case reported.[2] We describe the cases of three insulin-dependent diabetic women who presented to one diabetic clinic with anorexia nervosa. Two patients with a milder condition who refused psychiatric referral were also treated during the same six-month period.

Case reports

(1) The patient developed diabetes when aged 11 years. Difficulties in establishing diabetic control were in part attributed to the fact that the diabetes became a focus of family conflict. The patient rarely tested her urine or co-operated with dietary restrictions. When aged 17 she started to diet. Over six months her weight fell from 55·5 kg to 40·6 kg (standard weight 54·9 kg) and she ceased menstruating. No physical abnormalities were found and anorexia nervosa was diagnosed. Rapid weight loss did not lead to deterioration in diabetic control. In the psychiatric ward, however, manipulation of the diabetes complicated the management programme. Secret vomiting, refusal to provide urine specimens, and rejection of food after taking insulin all contributed to unexpected severe hypoglycaemic attacks.