

there was a significant rise in the $Paco_2$ ($P < 0.001$) in ten patients (table) but no significant change in the other two values. Mean plasma cholesterol concentration was 5.6 mmol/l (range 2.6-7.7) (216 mg/100 ml (100-297)) (normal 4-8 mmol/l (154-308 mg/100 ml)) while the mean plasma cortisol concentration in the 13 patients studied was 472 nmol/l (range 110-1090) (17 μ g/100 ml (range 3-39)). Normal at 0900 was 280-690 nmol/l (10-25 μ g/l). The routine biochemical and haematological tests showed no unexplained abnormalities.

Comment

These results do not confirm an association between alkalosis¹ or acidosis² and intractable pain. In the 13 patients studied the plasma cortisol concentrations were similar to those reported.³ Plasma cholesterol concentrations were within the normal range. Nevertheless, the low $Paco_2$ found in all groups associated with a normal pH confirms the chronicity of the hyperventilation observed. All but chronic anxiety and noradrenaline of the documented ventilation stimuli⁵ could be excluded as the stimulus to this hyperventilation. But whatever the ventilatory stimulant, it is almost certainly secondary to intractable pain. This is confirmed by the significant rise ($P < 0.001$) in $Paco_2$ found in the 10 patients who had obtained pain relief. It has been possible to use the rise in $Paco_2$ after pain relief as objective evidence of successful treatment.

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¹ Evans, R J, *Canadian Journal of Surgery*, 1972, **15**, 34.

² Lindhal, O, *Advances in Neurology*, vol 4, p 45. New York, Raven Press, 1974.

³ Lascelles, P T, *et al*, *Brain*, 1974, **97**, 533.

⁴ Keele, K D, and Stern, P R S, *Journal of the Royal College of Physicians*, 1973, **7**, 319.

⁵ Hey, E N, *et al*, *Respiration Physiology*, 1966, **1**, 193.

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Extensive retinal haemorrhages in infancy—an innocent cause

Extensive retinal haemorrhages in babies other than neonates are recognised as an important sign of child abuse,¹ being associated with violent shaking and the development of subdural haematomas,² and sometimes with thoracic compression.³ We report such haemorrhages in a baby who had patently not been a victim of abuse.

Case report

A previously well 2-month-old boy was left asleep in his pram in the garden protected by a cat net. After 30 minutes his father discovered him lying undisturbed but not breathing. He picked him up and found him pallid and limp, and thought he was dead. He called his wife, who came at once and held the baby to her shoulder and slapped him repeatedly on the back to try and revive him. Eventually he choked and spluttered, and at last began to breathe again. There was a little blood staining his face and the pillow, and some bloody mucus was expelled from his nostrils.

On arrival in hospital 10 minutes later he was still gravely ill, being barely conscious, shocked, and cyanosed, with erratic and inadequate respiration and a pulse rate of 160/min. He was afebrile. He was well-nourished, with no evidence of neglect or trauma, but there was blood caked in his nostrils. The eyes had no external injury and the media were clear, but we could see extensive fresh haemorrhages in the nerve-fibre layer of both fundi. There was bilateral macular oedema but no swelling of the optic discs.

His haemoglobin was 8.2 g/dl and chest radiography showed patchy bilateral perihilar shadowing. All other investigation results were negative

or normal (blood film; leucocyte and platelet counts; clotting studies; concentrations of serum electrolytes, calcium, and urea; cultures of blood and cerebrospinal fluid (CSF); CSF biochemistry and cytology; viral culture of nasopharyngeal secretions; skeletal survey; and subdural taps).

He rapidly improved after treatment with oxygen, intravenous fluids, and antibiotics. He remained irritable and hyperreflexive at first but after three days he was back to normal. He could fixate and follow a light, and optokinetic nystagmus was readily elicited. Electroretinography and measurement of visually evoked responses showed satisfactory function of both retinas and of the higher pathways. A repeat chest radiograph was clear. When reviewed two months later he appeared entirely unscathed by the experience. His eyesight seemed normal, and the retinal haemorrhages had completely resolved.

Because of initial suspicion of child abuse the parents were questioned with particular care on the child's admission and were later interviewed by a senior paediatrician. Their answers throughout were frank, consistent, and entirely convincing, and the family doctor and health visitor attested to their excellent parenthood. Not a single feature emerged from the social background, the history, or the physical findings to support this suspicion.

Comment

Retinal haemorrhages can be produced by thoracic compression that is insufficient to cause detectable damage to the chest itself.⁴ The retinal vessels of infants may be particularly vulnerable, for many babies have extensive fundal haemorrhages after an apparently normal birth.⁵ We think that this baby became apnoeic after aspirating blood from an epistaxis, and that his mother's life-saving measures transmitted pressure from the thorax to retinal veins that were already compromised by hypoxia.

To avoid accusing innocent parents of battering their babies vigilance for child abuse must be balanced by open-mindedness to alternative explanations for its typical features: extensive fundal haemorrhages are not invariably diagnostic.

We thank Professor J K G Webb for his encouragement in reporting this case.

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² Caffey, J, *American Journal of Diseases of Children*, 1972, **124**, 161.

³ Tomasi, L G, and Rosman, N P, *American Journal of Diseases of Children*, 1975, **129**, 1335.

⁴ Morgan, O G, *Transactions of the Ophthalmological Society of the United Kingdom*, 1945, **65**, 366.

⁵ Baum, J D, and Bulpitt, C J, *Archives of Disease in Childhood*, 1970, **45**, 344.

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Needle tracheostomy for acute upper airway obstruction

Emergency tracheostomy is seldom needed, but when it is speed and simplicity are important. The introduction of a Medicut intravenous cannula (Sherwood Medical Industries Ltd) into the trachea to provide a temporary airway while preparations are being made for a formal tracheostomy has been described but has not attracted the attention that it deserves. I describe a patient on whom needle tracheostomy was used successfully.

Case report

A 64-year-old man with a history of chronic sputum production (peak expiratory flow 150 l/min) was admitted with a five-week history of hoarseness and a one-week history of increasing shortness of breath. No obvious cause for his symptoms could be found, and there was no evidence of an acute exacerbation of his chronic lung disease. Radiography showed a hyperinflated chest, but the lung fields were clear and there was no bronchial neoplasm. Indirect laryngoscopy was arranged because of a possible laryngeal neoplasm. Before this could be done, however, he developed acute stridor