50 mg twice daily was started in April 1976 after urine sterilisation. No side effects were noted, and his renal function remained normal. However, 10 weeks later he developed crystalluria, with small irregular bright purple crystals, despite an excellent fluid intake. After two days the crystals blocked his Silastic urinary catheter and he required repeated bladder lavage. Nitrofurantoin, his only medication during the 10 weeks, was stopped, and the crystalluria disappeared within four days. Analysis showed a sterile urine with acidity 12×10^3 nmol/l (pH 4.9). The crystals showed solubilities typical of nitrofurantoin, and ultraviolet spectrophotometry² identified substantial quantities of nitrofurantoin in the crystals, with calcium and magnesium also present.

Case 2

After a transurethral resection for benign prostatic hypertrophy a 75-year-old man developed urinary incontinence requiring a permanent indwelling catheter. In the next six months he developed repeated urinary tract infections. After urine sterilisation prophylactic nitrofurantoin 50 mg twice daily was begun in April 1976. Six weeks later his Silastic catheter became blocked by small bright purple crystals. Nitrofurantoin treatment was stopped, and the crystals disappeared after three days of repeated bladder washouts. His only other medication was tetrabenazine 25 mg twice daily for Parkinsonism, which he continued unchanged through this episode.

Case 3

A 71-year-old woman required long-term urinary catheterisation after a severe right hemiparesis in June 1975. Repeated urinary tract infections occurred in the next nine months, and prophylactic nitrofurantoin was started in March 1976. Three months later her Silastic catheter became blocked by small irregular purple crystals. Her only medication, nitrofurantoin, was discontinued, and the crystals ceased after two days of bladder lavage.

Discussion

No previous cases of nitrofurantoin crystalluria have been reported either to the Committee on Safety of Medicines or to the manufacturers. Both the clinical and analytical evidence point very strongly to nitrofurantoin as being the cause of these three cases of crystalluria. All occurred in old people with urinary catheters who received modest doses of nitrofurantoin for long-term prophylaxis of urinary infections. These three cases all occurred during the recent heat wave, but the patients maintained a recorded urine output of at least 1800 ml per day throughout, and all had normal renal function. Since nitrofurantoin is used frequently in urinary chemoprophylaxis, crystalluria should be widely recognised as a potential problem, though probably an uncommon one.

¹ Goodman, L S, and Gilman, A, *The Pharmacological Basis of Therapeutics*, p 1008. New York, Macmillan, 1975.

² *British Pharmacopoeia*, p 321. London, HMSO, 1973.

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Acute epiglottitis requiring tracheostomy in an adult

Acute epiglottitis—an inflammatory swelling of the epiglottis or arytenoepiglottic folds—usually occurs in children between 18 months and 4 years of age. In adults it rarely leads to respiratory obstruction, though when it does the mortality may be high unless promptly

recognised and treated.¹⁻³ Such a case treated successfully by tracheostomy is reported here.

Case report

A 44-year-old man was admitted to hospital with a two-day history of sore throat, breathlessness, and minimal dysphagia. He was mildly dyspnoeic, flushed, and had a fever of 37.7°C. Pulse was 112/min, and blood pressure 150/105 mm Hg. The soft palate was injected and there were palpably enlarged submandibular and cervical lymph nodes. Bronchial breathing was heard at the left base with associated crepitations. Chest x-ray examination showed patchy consolidation in the left lower lobe. White cell count was $24 \times 10^9/l$ ($24\,000/mm^3$), with 90% neutrophils. Throat swabs were taken.

The patient was treated with humidified oxygen, ampicillin 500 mg six-hourly by mouth, and domiphen bromide lozenges. For 11 hours his condition remained unchanged, then rapidly deteriorated over half an hour with increasing stridor, altered level of consciousness, shock, and central cyanosis. A large, red, swollen epiglottis was noted and he was immediately given 200 mg hydrocortisone, 500 mg ampicillin, and 500 mg cloxacillin intravenously. An emergency tracheostomy was performed and he was transferred to the intensive care unit.

The throat swabs grew *Haemophilus influenzae* sensitive to ampicillin, and this and hydrocortisone were therefore continued in full therapeutic doses. Oxygen pressure remained low (62-74 mm Hg) the first day after tracheostomy, probably due to pneumonia. The epiglottis rapidly returned to normal, and the patient was extubated on the fifth day after admission. He was discharged on the ninth day, and 20 days later was fit with a well-healed tracheostomy scar.

Discussion

Epiglottitis differs from other respiratory tract infections in often causing rapidly progressive or abrupt airways obstruction,⁴ which may occur within two hours of onset.² Acute epiglottitis rarely leads to respiratory obstruction in adults, however, because of the larger larynx, smaller amount of loose mucosa, and more spatular shape of the epiglottis.⁵ It is more common in men aged under 45¹ and may be more frequent in winter and in polluted atmospheres.² Sore throat and dysphagia may be present for up to four days before obstruction occurs.³ The degree of shock and prostration seems to be out of proportion to the severity of the infection. Signs of respiratory distress—namely, increasing dyspnoea, cyanosis, and stridor—may be followed by death from respiratory obstruction within six hours.³

The commonest causative organism in adults is *H influenzae*, followed in decreasing order of frequency by group A β -haemolytic streptococci, *Staphylococcus aureus*, and pneumococci.⁴ Acute epiglottitis is a severe infection in adults, tracheostomy being needed in 30-60% of cases.¹⁻⁴ Treatment consists in maintaining clear airway, by tracheostomy if necessary. The initial antibiotic of choice is ampicillin.^{1 2 4} The place of steroids, however, is still controversial.^{2 3} The possibility of acute epiglottitis should be considered in any adult who presents with upper respiratory tract infection, disproportionately sore throat, dysphagia, or any degree of respiratory distress no matter how slight.

I thank Dr R Finn for permission to report this case, and Miss P Ralphs for secretarial help.

¹ Hawkins, D B, et al, *Laryngoscope*, 1973, **83**, 1211.

² Fearn, B W, et al, *Canadian Medical Association Journal*, 1975, **112**, 760.

³ Gorfinkel, H J, Brown, R, and Kasins, S A, *Annals of Internal Medicine*, 1969, **70**, 289.

⁴ Bass, J W, et al, *Journal of the American Medical Association*, 1974, **229**, 671.

⁵ Scott Brown, W G, et al, *Diseases of the Ear, Nose, and Throat*, 3rd edn, p 316. Philadelphia, Lippincott, 1971.

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