leukaemias do not appear to be induced close to CEGB nuclear power stations. It is true that small excesses of leukaemia in children and young people have been observed around some of the older non-CEGB nuclear establishments, but, as Doll and his coworkers have pointed out, it is difficult to ascribe these excesses to ionising radiation.² The absence of an increased incidence of leukaemia around CEGB sites would seem to exclude power generation also.

- 1 Cook-Mozaffari PJ, Ashwood FL, Vincent T, Forman D, Alderson M. *Cancer incidence and mortality in the vicinity of nuclear installations, England and Wales 1959-1980*. London: HMSO, 1987. (OPCS Studies on Medical and Population Subjects No 51.)
- 2 Forman D, Cook-Mozaffari P, Darby S, et al. Cancer near nuclear installations. *Nature* 1987;329:499-505.

Style

Dr ROBERT CUTLER (Surrey, Surrey KT6 6PR) writes: Little need be added to the article on style by Professor Sunil K Pandya (19-26 December, p 1662), which contains much helpful advice to speakers and writers generally. One trap for speakers blessed with a subtle wit is to overestimate the quickness of perception of the audience and overegg the pudding with too much of it. The quick witted relish the points immediately and start laughing, while those less mentally nimble need a second or so for the point to sink in and thus start laughing later. This is not disastrous if the flashes of wit are not too numerous, but if they are there is a constant rumble of laughter, which, like the canned television equivalent, may destroy enjoyment of the whole. Such addresses always read well because we read at our own speed.

Drug points

Chest pain after captopril

Dr J B DAVIS (Woodchurch, Birkenhead L49 7LP) writes: The vasodilator drug nifedipine has been reported to exacerbate angina when used for treatment of ischaemic chest pain,¹ perhaps by a vasodilatory "steal" phenomenon. The angiotensin converting enzyme inhibitor captopril is a powerful vasodilator which is reported to have an antianginal action in hypertensive patients with coronary artery disease.^{2,3} Two patients are reported on here in whom angina appeared to be precipitated by treatment with captopril.

A 57 year old overweight woman smoker had taken acebutolol 400 mg daily and indapamide for nine years for treatment of hypertension. Although blood pressure control was good, captopril was substituted because of breathlessness and reduced peak expiratory flow rate of 200 l/min. About 30 minutes after a single tablet of 25 mg of captopril she complained of severe central chest tightness at rest. A further captopril tablet was given four days later under observation and about 30 minutes later she developed severe central chest tightness, again at rest, accompanied by pallor and distress. Blood pressure was 185/90 mm Hg and the symptoms were rapidly relieved by sublingual trinitrate spray. In the second case a 68 year old male smoker was treated for hypertension with atenolol 100 mg and chlorthalidone 25 mg once daily for 10 years. His blood pressure was usually well controlled at around 160/85 mm Hg. One episode of exertional chest pain was reported in September 1984. In March 1986 his blood pressure had risen to 190/90 mm Hg and captopril 25 mg three times daily was added to his treatment. He developed exertional chest pain when walking uphill which occurred only after he took captopril, resolved when it was withdrawn, and recurred on its reintroduction. During the time he was suffering angina his blood pressure was noted to be 200/100 mm Hg.

Although angina was diagnosed solely on clinical grounds, in both cases the symptoms were typical and in the first case they were rapidly relieved by glyceryl trinitrate. Sudden withdrawal of a β adrenoceptor antagonist may predispose to rebound myocardial ischaemia⁴ and could have contributed to the severe rest symptoms in case 1. The onset of pain, however,

occurred close to the time of peak plasma concentration of captopril.⁵ The symptoms reported by these patients suggest that captopril may occasionally exacerbate pre-existing myocardial ischaemia. One previous case has been reported,⁶ and the manufacturers (Squibb) have over 40 reports of this side effect.

- 1 Lewis JG. Adverse reactions to calcium antagonists. *Drugs* 1983;25:196-222.
- 2 Daly P, Mettauer B, Rouleau JL, et al. Lack of reflex increase in myocardial sympathetic tone after captopril: potential anti-anginal effect. *Circulation* 1985;71:317-25.
- 3 Strozzi C, Cocco G, Portaluppi F, et al. Ergometric evaluation of the effects of captopril in hypertensive patients with stable angina. *J Hypertension* 1985;3 (suppl 2):S147-8.
- 4 Prichard BNC, Tomlinson B, Walden RJ, Bhattacharjee P. The β -adrenergic blockade withdrawal phenomenon. *J Cardiovasc Pharmacol* 1983;5:S56-62.
- 5 Duchin KK, Singhvi SM, Willard DA, et al. Captopril kinetics. *Clin Pharmacol Ther* 1982;31:452-8.
- 6 Baker KM, Johns DW, Ayers CR, Carey RM. Ischaemic cardiovascular complications concurrent with administration of captopril. *Hypertension* 1980;2:73-4.

Near fatal auditory hallucinations after buprenorphine

Mr E C PARASKEVAIDES (Tameside General Hospital, Ashton under Lyne OL6 9RW) writes: Buprenorphine is a newer narcotic analgesic with a much longer duration of action than morphine and a lower dependence potential, and when administered sublingually it is very effective in relieving moderate and severe pain. Its recognised side effects are less pronounced than those of morphine; they are drowsiness, nausea, vomiting, dizziness, sweating, rarely respiratory depression, constipation, and urinary depression.^{1,2}

A 50 year old man with no history of mental illness was given a single tablet of buprenorphine (200 mg) sublingually on the evening of the second day after haemorrhoidectomy. He had taken no other medication since his operation. Within half an hour he reported hearing voices which were instructing him to perform various chores on the ward. The duty psychiatrist was summoned and the patient was interviewed in the sister's office in the surgical ward, which was situated on the fourth floor of the hospital. Suddenly the patient stood up and threw himself out of the window. He sustained serious injuries for which he underwent major orthopaedic surgery. Fortunately he survived, and close questioning subsequently revealed that he had been ordered to jump by the voices. He readily recollected the auditory hallucinations and remarked on their apparent reality at the time. He did not experience any hallucinations, confusion, or other mental disturbance subsequently. There was no mental illness in his family. It seems likely that the near fatal auditory hallucinations were a side effect of sublingual buprenorphine. The manufacturer has reports of three other cases of auditory hallucinations.

- 1 Walker G, Massam D. *ABPI data sheet compendium 1986-1987*. Beccles and London: Datapharm Publications Limited, 1986: 1232-3.
- 2 Joint Formulary Committee. *British national formulary*. 13. London: Pharmaceutical Press, 1987:170.

Neuroleptic malignant syndrome associated with metoclopramide

Drs T CASSIDY and S K BANSAL (Ryhope General Hospital, Sunderland SR2 0LY) write: The neuroleptic malignant syndrome is an uncommon condition characterised by pyrexia, muscular rigidity, fluctuating consciousness, and instability of the autonomic nervous system. We report a case of the syndrome associated with metoclopramide.

Forty eight hours before admission this 73 year old man had been well and painting his house. On developing nausea he had taken three 10 mg tablets of metoclopramide. Within 24 hours he was disorientated in time and place. Three years previously he had had a right above the knee amputation for peripheral vascular disease, for which he continued to take inositol nicotinate. On examination there was generalised muscular rigidity but no focal signs. The next day he became feverish (38°C) and lapsed into

an unconscious state not responding to pain. Investigations showed: haemoglobin 170 g/l, white cell count $12.5 \times 10^9/l$ (neutrophils $10.13 \times 10^9/l$ and lymphocytes $1.37 \times 10^9/l$); electrolytes, erythrocyte sedimentation rate, electrocardiogram, chest radiograph, blood and urine cultures, and lumbar puncture findings were all normal; and creatine phosphokinase activity was 1400 IU/l (50-281 reference range), becoming normal by the fourth day. A diagnosis of neuroleptic malignant syndrome was made, and the patient was started on bromocriptine,² initially 2.5 mg twice daily increasing to 5 mg three times a day over a week. Within two days he became afebrile. His muscular rigidity disappeared by the sixth day, but he developed orofacial dyskinesia which lasted for four days. His conscious level improved, he responded to voices, and he could speak the occasional word. Unfortunately this improvement was not maintained and five days later he lapsed into a coma with no focal signs and died on the 20th day of admission. Necropsy showed bilateral bronchopneumonia with extensive left frontoparietal lobe infarction (histology showed that the infarction was less than five days old) and generalised arteriosclerotic disease.

The features suggestive of the neuroleptic malignant syndrome in this case were fever and leucocytosis in the absence of infection, a fluctuating level of consciousness, muscular rigidity, the patient's response to bromocriptine, and raised creatine phosphokinase activity. The necropsy findings in the neuroleptic malignant syndrome are non-specific³ and in this case would not explain the original illness. The potential of a drug for inducing the syndrome seems to parallel its antidopaminergic activity.⁴ Metoclopramide is a specific antagonist of dopamine 2 receptors in the brain and has been suspected of inducing neuroleptic malignant syndrome in one other case in Britain⁵ and several in the United States.⁶⁻⁸ As this drug is widely used the possibility of inducing this uncommon syndrome should be known.

- 1 Delay J, Deniker J. Drug induced extrapyramidal syndromes. In: Vinken PJ, Bruyn GW, eds. *Handbook of clinical neurology*. Vol 6. New York: North Holland Publishers Co, 1968:248-66.
- 2 Pearlman CA. Neuroleptic malignant syndrome: a review of the literature. *J Clin Psychopharmacol* 1986;6:237-73.
- 3 Shago RA, Dorack DT. The neuroleptic malignant syndrome. *Arch Intern Med* 1982;142:1183-5.
- 4 Henderson VW, Wooten GF. Neuroleptic malignant syndrome. A pathogenetic role for dopamine receptor blockade? *Neurology* 1981;31:132-7.
- 5 Robinson MB, Kennett RP, Harding AE, Legg NJ. Neuroleptic malignant syndrome associated with metoclopramide. *J Neurol Neurosurg Psychiatry* 1985;48:1304.
- 6 Freidman LS, Weintach LA, E'elia JA, et al. Metoclopramide induced neuroleptic malignant syndrome. *Arch Intern Med* 1987;147:1495-7.
- 7 Samie MR. Neuroleptic malignant-like syndrome induced by metoclopramide. *Movement Disorder* 1987;2:57-60.
- 8 Anonymous. Metoclopramide. Neuroleptic malignant syndrome [Editorial]. *Clin-Alert* 1987 Sept 11:215.

Erythromycin: a case of nightmares

Dr NERY S WILLIAMS (Solihull, West Midlands) writes: A 23 year old woman with no history of exposure to the drug was treated with erythromycin 250 mg four times a day for oropharyngeal sepsis. Forty eight hours after starting treatment she experienced violent disturbing dreams but continued the antibiotics. Similar nightmares occurred the next night and she presented to her general practitioner, who advised discontinuation of the drug. Further nightmares occurred the night after cessation of treatment, but subsequent nights were trouble free. There were no other drugs taken and no adverse social events or history of such severe dreams. Erythromycin has been reported to cause ototoxicity and psychotic reactions.¹ The Committee on Safety of Medicines has 21 reports of psychiatric disturbance, of which six were of hallucinations (personal communication). The committee also reports one case of nightmares associated with the ethyl succinate ester of erythromycin (personal communication).

I thank Dr P J Travis for allowing me to report this case.

- 1 Greg SU, Neumann KH. Ototoxicity and acute psychotic reaction in cancer patients with hepatic dysfunction. *Arch Intern Med* 1986;146:897.