in symptomless hypertensive patients with hyperparathyroidism. The meaning of the epidemiological association of calcium and blood pressure also needs elucidating.

A K SANGAL

Research fellow

D G BEEVERS

Senior lecturer in medicine

Dudley Road Hospital,
Birmingham B18 7QH

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Pneumocystis pneumonia

Pneumocystis pneumonia was originally described in the 1940s as an epidemic disease affecting premature or malnourished infants in eastern Europe. In Britain *Pneumocystis carinii* has been recognised since 1955 as the cause of an interstitial pneumonia carrying a high mortality,¹ but its behaviour is still a puzzle. Probably a sporozoan, it alternates between trophic and cystic phases and can multiply rapidly with an asexual life cycle.² Serological data suggest that carriage of the organism is extremely frequent in early life,³ giving rise to the concept (as yet unproved) that the pneumonia may sometimes develop as an opportunistic infection resulting from reactivation of latent organisms in immunosuppressed individuals.

Until 1981 the disease was most commonly seen in patients receiving cytotoxic treatment for leukaemia and lymphoma.⁴ In the past 12 months, however, the aptly named "gay compromise syndrome" has brought the problems of diagnosis and management of pneumocystis pneumonia to a wider audience.⁵ The syndrome occurs chiefly in healthy homosexual men⁶ but also in women⁷ and may include a range of opportunistic infections, particularly pneumocystis pneumonia, and also Kaposi's sarcoma. The pneumonia in such patients may be rapidly progressive with a mortality of 40% despite treatment.

The syndrome has been recognised mainly in North America, where the incidence is rising sharply, but cases have also been described in Britain and in Denmark.^{8 9} Its basis appears to be acquired immunosuppression, possible causes of which include cytomegalovirus infection and the liberal use of "recreational" drugs such as inhaled nitrites, both of which are common among homosexuals. Certainly the syndrome provides one of the clearest instances of the profound effects of immunosuppression, and further research by virologists, immunologists, and tumour biologists may well prove fruitful on several fronts.

What are the problems of diagnosis of pneumocystis pneumonia and how is it treated? The pneumonia presents clinically with severe dyspnoea, often acute in onset, together with a non-productive cough, fever, and loss of weight. Physical signs in the chest are characteristically few, despite both the degree of dyspnoea and the radiographic picture, which typically shows diffuse bilateral shadowing giving a ground glass appearance. Serological tests are of little diagnostic value, and efforts to culture the organism have met with only very limited success.¹⁰ Hence the diagnosis is generally made by microscopic examination of tissue obtained either by open lung biopsy or else by less invasive measures such as percutaneous needle, transbronchial, or endobronchial brush biopsy.

Untreated, pneumocystis pneumonia carries a mortality of virtually 100% and, despite some recent progress, patients may still die—not least because of other serious opportunistic infections in immunosuppressed individuals. Pentamidine isethionate (4 mg/kg/day) has been shown to be effective treatment for pneumocystis pneumonia in all age groups, but the drug has toxic effects on the kidneys and the liver and gives serious local reactions in up to half of patients treated.⁴ In 1975 Hughes and colleagues showed that co-trimoxazole was also effective in children in doses greater than those usually used for bacterial infections.¹¹ In a randomised trial co-trimoxazole was as effective as pentamidine (recovery rates of 77% and 75%), but was clearly much less toxic.¹² More recently Sattler and Remington have confirmed that at the appropriate dose co-trimoxazole is highly effective given by the intravenous route in seriously ill adults as well as in children suffering from pneumocystis pneumonia, with 80% of patients responding to treatment.¹³ Finally, Hughes *et al*¹⁴ showed in a placebo controlled randomised trial that prophylactic use of co-trimoxazole reduced the incidence of pneumocystis pneumonia among children receiving treatment for acute leukaemia, and this policy has attracted increasing popularity. More recently, however, Hughes has added a note of caution with evidence from studies on immunosuppressed rats that co-trimoxazole could not eradicate *P carinii* from the lungs, and he concluded that patients might be protected only during the period of drug administration.¹⁵

S B KAYE

Senior Lecturer in Clinical Oncology,
University of Glasgow,
Glasgow G12 9LY

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Evaluation of syncope

Sudden, temporary loss of consciousness from an abrupt impairment of cerebral blood flow often has a benign cause but it may herald disaster. Certain forms of syncope are instantly recognisable from the context in which they occur—at the school assembly, on the parade ground, or with venepuncture, fear, shock, or pain. Further investigation after negative results of an examination may lead to alarm and treatment which is not justified by the benign prognosis. When there is a clinical indication for investigation a carefully directed approach is important, as shown by two retrospective studies of syncope from hospitals in the United States. In the Boston study¹ a diagnosis was established on the basis of the initial assessment in 172 of 198 consecutive patients presenting at the emergency room with transient loss of consciousness. Of the remaining 26 patients, no diagnosis was reached in 25 despite intensive investigation. In the Pittsburgh survey² the cause of syncope was evident from the initial history and the results of examination in 89 of 210 patients admitted to the wards. Of the remaining 121 patients, a definitive diagnosis was made in only 13 at an average cost of \$2463 a patient. Many of the tests performed, such as computed tomography, radionuclide scanning, skull radiography, lumbar punctures, and glucose tolerance tests, did not aid the diagnosis in any patient.

Two-thirds¹ of patients present with a recognisable medical disorder and a further few have a family history of cardiomyopathy or conduction defects in the heart; such a history is important but may prove to be misleading. Adverse responses to drugs³ may mimic every form of syncopal attack. No drug is exempt, and it is unwise to embark on extensive investigation until drug-induced syncope has been ruled out. A description of the actual attack is valuable: the pallor of a simple syncopal attack rarely impresses the witness as much as the deathly

colour of the Stokes-Adams attack, and the dramatic surge of colour and instant clarity of thought on recovery are never seen after seizures. The duration of attacks,⁴ trigger factors, and presyncopal activity help differentiate syncope from conditions such as epileptic, hypoglycaemic, hysterical, hyperventilation, transient ischaemic, and drop attacks. A detailed history thus serves to characterise the type of syncope, the need for further investigation, and the likely prognosis. For example, once recognised, cough syncope, micturition syncope, weightlifter's blackout, and syncope related to pain, as with basilar migraine or glossopharyngeal and vagal neuralgia,⁵ require only limited investigation.

Other forms of presyncopal activity, however, may indicate the need for specific investigation: effort syncope tends to be cardiac⁶; syncope specifically with the use of an arm suggests the subclavian steal syndrome; syncope with movements of the neck cerebrovascular insufficiency or carotid sinus hypersensitivity; syncope with postural changes orthostatic hypotension or atrial myxoma or thrombus; syncope with defecation pulmonary embolism; and syncope with swallowing either glossopharyngeal neuralgia or a pharyngeal tumour.⁷ Pain in the chest or palpitations often indicate a cardiac lesion or aortic dissection and abdominal pain intra-abdominal haemorrhage. When systemic emboli and syncope occur together abnormalities of the atria such as the sick-sinus syndrome⁹ are likely. Idiopathic and drug-induced orthostatic hypotension may be linked with autonomic disturbances such as impotence and lack of sweating.

A physical examination at the time of an attack is helpful—for example, abnormal neurological signs may indicate cerebral lesion or epilepsy. Absent pulsations in cardiac syncope may, however, be extraordinarily difficult to verify, particularly as a normal rhythm may return in a matter of seconds. Palpation and auscultation over the neck and limbs may point to an embolism, dissection, or vascular disorders. A comparison of erect and supine blood pressure may indicate orthostatic hypotension. Gentle massage of the carotid sinus may expose an underlying atrioventricular conduction defect, sinoatrial disorder,¹⁰ or a true carotid sinus syndrome,¹¹ although it should be performed only in hospital together with a simultaneous electrocardiogram, and ideally electroencephalogram and blood pressure recordings. A later thorough examination may show up cardiac arrhythmias, or valvular disease, endometriosis, even an ectopic pregnancy.

Baseline tests for most patients should include full blood count, packed cell volume, and sedimentation rate to exclude anaemia or blood dyscrasias. When there is a possibility of hypovolaemia, orthostatic hypotension, or endocrine dysfunction further laboratory tests are required. A plain chest x-ray examination is prudent and an electrocardiogram mandatory in all but the most obvious cases of simple syncope. Any defect of atrioventricular conduction or evidence of inferior wall myocardial infarction should raise the possibility of Stokes-Adams attacks, and anterior myocardial infarction, pre-excitation syndromes (characterised by a short P-R interval and abnormal QRS complex) or prolonged Q-T interval should warn of the possibility that life-threatening tachyarrhythmias may occur. A full standard electroencephalogram with an electrocardiogram trace is also of value. This may be repeated in the fasting state, with turning of the head or carotid massage. Echocardiography is useful in the diagnosis of lesions such as hypertrophic cardiomyopathy, atrial myxoma, mitral valve prolapse, or amyloid heart disease.^{2 12} Provocative tests such as pressure on the eyeball and the Valsalva manoeuvre are acceptable in children and young adults but are risky in the