Cases 3 and 4—A 70 year old man and his 60 year old wife were found dead by the police in a bungalow adjoining those of the patients in cases 1 and 2. It was reported that the couple had previously and simultaneously complained of headache, nausea, and dizziness. Their skin and mucosa showed pink discoloration. At necropsy the heart and great vessels were engorged by blood whose carbon monoxide saturation was 75%. Multiple pinpoint haemorrhages were observed in the cut surfaces of their oedematous brains.

Case 5—The 72 year old husband of the patient in case 2 had been admitted to hospital in a neighbouring town three days before his wife and with a similar presentation. Carbon monoxide analysis was not performed. Though semiconscious and showing periodic respirations on admission, he made a full neurological recovery. A retired miner, he realised in retrospect that the prodromal symptoms that he had suffered had resembled those experienced years earlier when he was exposed to carbon monoxide.

Case 6—A 71 year old woman, who had been a previous occupant of the bungalow in which the patients in cases 3 and 4 were found, had experienced intermittent headaches and dizziness while living there. Her granddaughter had been similarly affected at each visit to the bungalow.

Further inquiries ordered by the coroner indicated that the gas fired, ducted air central heating system in each bungalow was functioning satisfactorily with no evidence of incomplete combustion of natural gas, which contains no carbon monoxide.

More detailed investigation showed that carbon monoxide was intermittently present at the points where service pipes and cables entered the bungalows. The concentration of carbon monoxide increased as the atmospheric pressure fell, and its source was traced to an old mine shaft some distance from the bungalows and sunk in 1780. Coal mining had stopped in 1933, and the shaft had been filled with rubble. Industrial waste had recently been burned outside a nearby factory, however, and the fire had spread to the materials in the mine shaft. Analysis of the gases in the mine confirmed that carbon monoxide was present. This was seeping down the shaft and through fissures and faults in the porous sandstone underlying the area before passing up intermittently into the bungalows. The shaft was reopened and the gas extracted before refilling. The bungalows were demolished.

Comment

In 1981 in a circular to health authorities the medical officers of British Gas reminded doctors of the vague symptoms of carbon monoxide poisoning. Old people with pre-existing cerebral, cardiac, or pulmonary disease are at particular risk from incomplete combustion of household gas especially if confined to badly ventilated houses in adverse weather. An alternative explanation emerged in the cases reported here, but this must be regarded as a rare cause of carbon monoxide intoxication even in former mining communities.

We are grateful to Her Majesty's Coroner for Gateshead and South Tyneside for allowing us to quote information from the necropsy reports in cases 2, 3, and 4.

¹ Matthew H, Lawson AAH. *Treatment of common acute poisonings*. Edinburgh and London: Churchill Livingstone, 1972.

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Percutaneous transfemoral lumbar aortography as an outpatient procedure

Peripheral vascular disease accounts for 4-5% of general practitioner consultations by patients aged over 65¹ and for about 6% of deaths from circulatory disease.² Since the advent of transluminal angioplasty as an alternative method of treatment the demand for arteriography has been increasing. In many centres translumbar aortography under general anaesthesia is still performed as the standard examination. We use the transfemoral percutaneous approach under local anaesthesia and mild sedation, a thin walled 5.3 French catheter (William Cook, Europe) proving as satisfactory as the 7 or 8 French catheters. It has been standard practice for the patient to remain in bed for 24 hours

after femoral arterial puncture, the average hospital stay being three days. Occasionally hospital admission may be prolonged until surgery can be undertaken.

We decided to assess the feasibility of early mobilisation after routine transfemoral arteriography using the small catheter technique and to determine whether uncomplicated cases could be managed as an outpatient procedure.

Method and results

Forty eight patients with peripheral vascular disease who were being routinely investigated were included in the trial. The age range was 41 to 74 years. We also included in the trial two other patients, who were being assessed after renal transplantation.

We used a standard Seldinger technique and a 5.3 French thin walled polyethylene pigtail catheter, which has six side ports and is 65 cm long. The catheter may be introduced over a 0.035 in (0.89 mm) guide wire and was routinely used with a 4 French dilator. Contrast medium was injected at a rate of 10 ml/s. At the end of the procedure the catheter was removed and compression applied for 10 minutes. No dressings or pressure pads were placed over the puncture site. Standard observations of pulse, blood pressure, and puncture site were recorded every 15 minutes for one hour and then every 30 minutes for three hours. After four hours the puncture site and condition of the patient were assessed and if satisfactory the patient allowed to mobilise gently, avoiding strenuous exertion. The standard management of bed rest for 24 hours was reinstituted if there were any problems during the initial four hours. All patients were further assessed in the evening and next morning.

Forty five of the 50 patients were mobilised. Three patients had transient hypertension (systolic pressure 170-180 mm Hg, diastolic 105-120 mm Hg) during the initial assessment on returning to the ward. These blood pressures quickly returned to normal and did not rise after mobilisation. A fourth patient developed transient hypertension after 24 hours, suggesting that this was unrelated to the arteriogram or early mobilisation. Nausea and vomiting occurred in four patients in the initial period and two patients within 12 hours, one of these requiring antiemetics.

Five patients were not mobilised. One of these felt generally unwell, and another had such severe peripheral vascular disease that mobilisation was thought inadvisable. A third patient developed a respiratory tract infection, and the others were inadvertently kept in bed. None of the patients developed any complication from the arterial puncture site.

Comment

Of the 50 patients in this study, 45 were mobilised after four hours. The decision to manage the remaining patients by 24 hours of bed rest was made during the four hours before mobilisation. No untoward sequelae resulting from early mobilisation were detected in any patient.

The low incidence of minor complications associated with aortography under local anaesthesia has been confirmed by other studies.^{3,4} The complications associated with translumbar aortography are well known⁵ and may in part be avoided by the percutaneous transfemoral route.

We believe that angiography under local analgesia using the 5.3 French catheter may be safely performed as a day case procedure; and the reduced hospital stay and percutaneous transfemoral route are more acceptable to the patients.

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³ Hessel SJ, Adams DF, Abrams L. Complications of angiography. *Radiology* 1981;138:273-81.

⁴ Hessel SJ, Schreiber MH. Translumbar aortography as an outpatient procedure. *AJR* 1981;137:1287.

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