Sodium azide poisoning in five laboratory technicians

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ABSTRACT Five laboratory technicians accidentally ingested sodium azide, in quantities varying from 20 to 80 mg, in tea made from distilled water kept in a laboratory. Four had short-lived symptoms of dizziness, pounding heart, and faintness, while another developed a picture of myocardial ischaemia. He had further episodes of chest pains necessitating admission to hospital. These later symptoms were thought to be psychogenic in origin.

Five laboratory technicians were eating lunch in a small storeroom adjacent to a laboratory. Three minutes after drinking a cup of tea, one of the girls felt faint with a pounding heart and fuzzy head. A few minutes later, two other girls who had also drunk a cup of tea had similar symptoms. The fourth technician, a man aged 24 who had had two cups of tea, fell to the floor with violent cramp-like pains in his chest radiating to the axilla and down both arms, with some tingling in his legs. No one associated his ill health with that of the previous three technicians who had left the room, and it was thought by the doctor who saw him at that time that he was suffering from myocardial ischaemia and he was sent to hospital. The fifth technician who had had half a cup of tea felt vaguely unwell.

The technician who filled the kettle from which the tea was made realised that she had used distilled water that had been treated with sodium azide (NaN₃) to prevent bacterial growth. After two hours in the casualty department all the patients recovered.

Three days later the male technician experienced a recurrence of the tightness and pains in his chest and fainted. He walked to the local hospital and after being reassured went home. He was apprehensive and unable to sleep. These symptoms persisted, and he was given diazepam and later relaxation therapy. Though some improvement took place the pain in his chest persisted. Barium meal showed an incompetent cardia and gastro-oesophageal reflux. Two months after the original incident he was admitted to hospital with chest pains. Repeat ECG was normal as were the fasting lipids. Six months later he was once more admitted to hospital for the

investigation of chest pain. Results of the investigations were normal.

Environmental investigation

Analysis of the distilled water/sodium azide solution with which the tea was made showed it to contain 214 mg/l and after boiling for ten minutes 220 mg/l of sodium azide; one cup of tea would thus contain about 40 mg. The addition of 10 g of powdered aluminium reduced the concentration of the sodium azide to 60 mg/l, but this is not important in the present instance because the electric heating element of the kettle was not aluminium (T E King, personal communication, 1980).

Discussion

Sodium azide is well known as a preservative of sera and other reagents in pathological laboratories and has been used therapeutically. Doses of 0.65–1.35 mg (0.01–0.02 mg/kg) by mouth produce a prompt fall in blood pressure lasting 10 to 15 minutes.¹ The administration of 1.3 mg of sodium azide three times a day for 10 days to nine normal individuals, however, did not have a sustained effect on blood pressure, and no effects were observed except for a pounding sensation in the head. Thirty hypertensive individuals have been treated with 0.65–3.9 mg by mouth daily for one week to two-and-a-half years to control hypertension without ill effects.²

Accidental poisoning by sodium azide has been described in eight people.^{3–7} In the first case³ 50–60 mg of sodium azide by mouth produced sudden collapse, loss of consciousness, and incontinence with severe headaches and a pulse rate of 120/min. Their other case complained of indigestion, headache,

sweating, and faintness, also within five minutes of a dose of 5–10 mg of sodium azide.

In our report three technicians ingested some 40 mg sodium azide and developed symptoms that disappeared quickly and completely. The fourth who ingested only some 20 mg was affected to a lesser degree. The male technician who presented a clinical picture of myocardial ischaemia ingested some 80 mg of sodium azide. This patient had no knowledge at that time of the illness of the others, or that his symptoms were due to sodium azide.

The severity of symptoms was thus related to the dose ingested in four of the patients. In the technician with a dose of 80 mg, however, symptoms of myocardial ischaemia developed, and these have not previously been described. The initial rapid recovery after a few hours is not inconsistent with the view that this was a direct result of the sodium azide, although the recurrent episodes of chest pain with

admission to hospital suggest an added psychogenic element.

References

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Scipione Caccuri Prize

The “Fondazione Clinica del Lavoro” has established an International L20 000 000 (twenty million Italian lire) prize in memory of Professor Scipione Caccuri, the former director of the Institute of Occupational Medicine at the University of Naples. The prize will be assigned to a previously unpublished work making an original contribution in the field of occupational and industrial medicine, physiopathology, and hygiene. Texts written in Italian, French, English, German, or Spanish considered meritorious will be published in a special number of *Giornale Italiano di Medicina del Lavoro*. Such texts should be addressed to: Segreteria della Fondazione Clinica del Lavoro, Via Boezio, 26, 27100 Pavia (Italy) and should be received by 31 December 1983.

Correction

Acute and subacute symptoms among workers in the printing industry (February 1982)

Figures 4 and 5 have been interchanged: figure 4 is the figure on page 73 while figure 5 is on page 72.