

Pseudo-pheochromocytoma due to alcohol withdrawal

J.F. Potter and D.G. Beevers

University Department of Medicine, Dudley Road Hospital, Birmingham B18 7QH, UK.

Summary: Alcohol withdrawal hypertension is a common clinical problem which often goes unrecognized. We report a case in which the symptoms and signs of withdrawal with a marked elevation in blood pressure mimicked the features of a pheochromocytoma. Despite a positive phentolamine test no further evidence for pheochromocytoma was found and both blood pressure and symptoms settled as the features of alcohol withdrawal abated.

Introduction

The alcohol withdrawal syndrome, with its symptoms of sweating, tremor, headache and the signs of tachycardia and raised blood pressure may at times suggest a diagnosis of pheochromocytoma. Furthermore, plasma catecholamine levels and urinary metanephrine excretion may be raised (Potter *et al.*, 1984). The exclusion of the diagnosis of a genuine pheochromocytoma may often be difficult, and no single test is infallible (Allison *et al.*, 1983). Despite the increased availability of plasma and urinary catecholamine assays, it may still sometimes be helpful to resort to provocative (histamine or glucagon) or suppression (phentolamine) tests although these procedures may produce both false positive and negative results. The advantages of the phentolamine test are that it is relatively safe, requires no specialized facilities, can be used during a hypertensive crisis and provides an instant result.

We have recently encountered a case of the alcohol withdrawal syndrome in whom the clinical features suggested the diagnosis of pheochromocytoma and in whom the phentolamine test was positive.

Case report

A 53 year old male brewery worker was admitted in a confused and agitated state after taking an unknown number of paracetamol tablets together with a bottle of whiskey 7 h before admission. He was a known alcoholic who had been admitted on many occasions with acute intoxication. He had been noted to have a raised blood pressure (BP) on previous admissions for

which he had undergone investigation. Serum urea and electrolyte levels, intravenous urography, abdominal ultrasound and 6 sets of urinary metanephrines had all been normal, although mildly raised serum gamma glutamyl transpeptidase (GGT) and aspartate aminotransferase levels had been noted. Treatment at that time was propranolol and bendrofluazide which he had taken up to the day of admission.

On admission the patient was drowsy with a BP of 200/140 mmHg and a pulse rate of 80 beats/min. The rest of the physical examination was normal apart from a liver palpable 2 cm below the costal margin and grade II hypertensive changes of the optic fundi. The plasma paracetamol level was 31 mg/l (compatible with low-grade toxicity), a random blood sugar 7.5 mmol/l and no blood alcohol was detected. No specific therapy was given but 3 h after admission, on regaining full consciousness, the patient developed sweating, headache, nausea, tremor and became increasingly agitated. At this time his BP was 240/160 mmHg with a pulse rate of 80 beats/min. The possible diagnosis of pheochromocytoma was considered and a phentolamine test was performed.

Prior to the administration of 5 mg phentolamine intravenously, his BP was 170/140 mmHg but within 2 min systolic pressure fell by 35 mmHg and diastolic pressure by 30 mmHg (see Figure 1). Fifteen minutes later the BP had risen again to 170/130 mmHg. After 48 h the BP settled to 145/85 mmHg and he was discharged on his original antihypertensive treatment. Liver and thyroid function tests, GGT and plasma cortisol levels were normal throughout his admission. Detailed investigation failed to confirm the diagnosis of pheochromocytoma; four more 24 h urine collections (taken 3 to 6 d after admission) for metane-

Correspondence: J.F. Potter, M.R.C.P.
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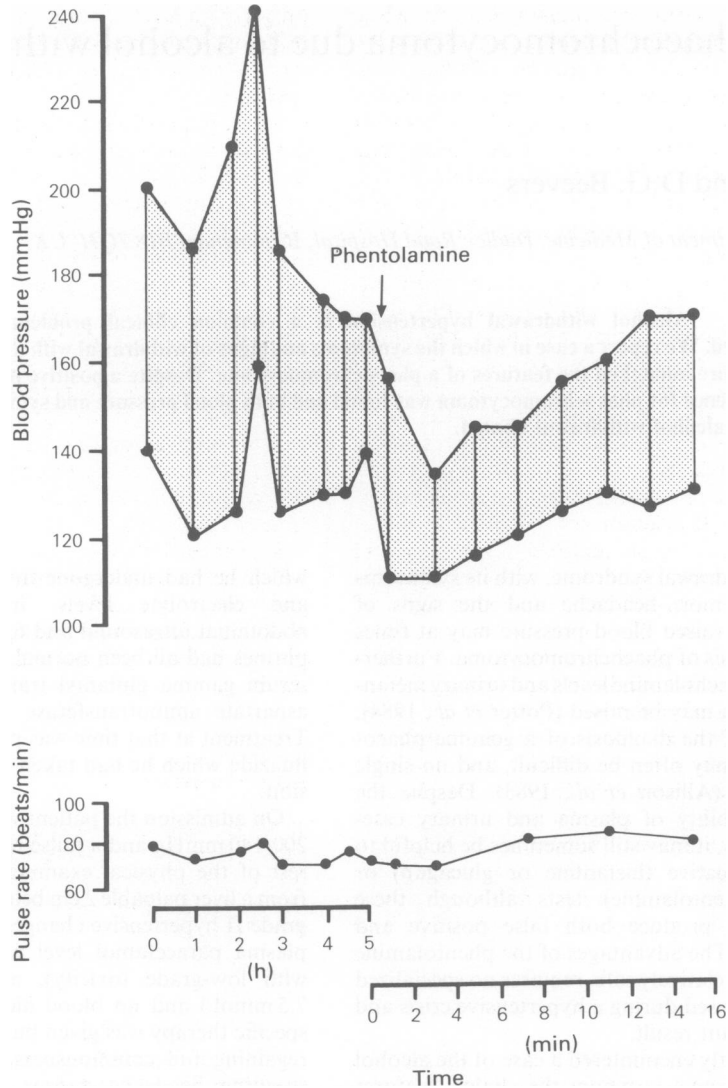


Figure 1 Blood pressure and pulse rate before and after administration of phentolamine.

phrines were normal and no further hypertensive crises were encountered. The patient was subsequently lost to follow up.

Comment

The signs and symptoms exhibited in this case resembled those of phaeochromocytoma, though further investigation failed to confirm this diagnosis. Other

conditions, including hypoglycaemia and thyrotoxicosis, may clinically resemble the condition but these were excluded so it is likely that the clinical picture here was due to alcohol withdrawal.

Most authors still regard at least two 24 h urine metanephrine excretions as the most useful screening test for phaeochromocytoma; these giving the fewest false negative results (Remine *et al.*, 1974). Plouin *et al.* (1981) have suggested that urinary catecholamine estimations provide better diagnostic precision than

determination of plasma catecholamine levels. More complex tests, including pentolinium suppression (Brown *et al.* 1981), have to be conducted in specialized centres where plasma catecholamines can be measured. There is still occasionally a case for performing a phentolamine test despite occasional false positive and negative results (Gabriel, 1972; Sheps *et al.*, 1966). It is easy to perform, has both therapeutic and diagnostic use and can aid diagnosis during a hypertensive crisis.

The acute fall in BP after phentolamine in this patient has two important implications. Firstly, it suggests that alcohol withdrawal is a previously undescribed cause of a false positive test. The second implication is that it may explain the mechanism of alcohol-withdrawal-hypertension. We noted in a study of 132 alcoholic patients that the height of the BP during detoxification is proportional to the severity of the alcohol withdrawal symptoms (Saunders *et al.*, 1981). It is important to note in this case that the hypertensive crisis occurred when the blood alcohol level was zero. Alcohol-withdrawal-hypertension is probably mediated by sympathetic hyperactivity associated with the stress of discontinuing drinking. Raised urinary metanephrines and plasma noradrenaline levels have been reported and these return to normal after detoxification (Potter *et al.*, 1984). Beta-adrenergic blocking agents reduce the heart rate and blood pressure associated with alcohol withdrawal (Potter *et al.*, 1984). Prior beta-blockade in this patient may explain the absence of tachycardia despite severe withdrawal symptoms. As noradrenaline mediated alpha-vasoconstriction is the cause of the acute hypertensive crisis due to phaeochromocytoma and alcohol withdrawal, immediate

anti-hypertensive therapy should be with an alpha-adrenoreceptor blocking agent, such as phenoxybenzamine with the later addition of a beta-blocker if necessary.

Many population studies have shown a relationship between alcohol intake and blood pressure (Clark *et al.*, 1967; Klatsky *et al.*, 1977). It is possible that this relationship results from the acute effects of alcohol withdrawal, hence in clinical practice, blood pressure is measured in heavy drinkers not during acute intoxication but while in a state of sub-clinical withdrawal. It is likely that there are at least two different mechanisms to explain the link between alcohol and blood pressure. Firstly, 'alcohol-withdrawal-hypertension', mediated by increased sympathetic activity, as in this case, which occurs when blood alcohol reaches zero. By contrast 'alcohol-induced-hypertension' may occur as a direct effect of alcohol, due to its vasoconstrictor action on arteriolar smooth muscle (Altura *et al.*, 1983).

In conclusion, therefore, a false positive phentolamine test in alcohol-withdrawal-hypertension is a previously undescribed phenomenon. It may, however, at least shed some light on the mechanisms of the link between alcohol and blood pressure in heavy drinkers.

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