Widespread cerebral ischaemia treated with nimodipine in a patient with eclampsia

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Br Med J 1990;301:794

Eclampsia may be associated with various focal neurological features¹ that often resolve within a few hours or days, suggesting that their aetiology is different from that of the severe haemorrhage described in the early postmortem studies. We recently reported results of magnetic resonance imaging that implicate cerebral ischaemia in the cortical blindness of eclampsia,¹ and cerebral vasospasm has been described in angiographic studies of patients with eclampsia.² We describe the experimental administration of nimodipine, a fairly selective cerebral vasodilator,³ to a moribund patient with eclampsia.

Case report

A 31 year old woman was admitted in the 38th week of her first pregnancy with the features of severe pre-eclampsia. Within a few hours she had a caesarean section, and immediately after delivery she was given a loading dose of phenytoin as prophylaxis against seizures. Seven hours postpartum she had a generalised convulsion. An additional 300 mg of phenytoin was given, but she had another convulsion, which was controlled by diazepam, one hour later. She had jaundice and stiffness of the neck, her coagulation variables were abnormal, and transaminases were raised. Fresh frozen plasma was given. Computed tomography 10 hours after delivery showed areas of low attenuation consistent with ischaemia or infarction

in the brain stem and thalamus. There was no evidence of cerebral haemorrhage. Over the next four hours she had several generalised convulsions despite receiving an infusion of chlormethiazole and her phenytoin concentration being in the therapeutic range. She was given a transfusion of platelets because of worsening thrombocytopenia. Magnetic resonance imaging showed extensive areas of high signal intensity consistent with cerebral ischaemia (figure).

Seventeen hours after delivery, on the assumption that the relentless neurological deterioration was the potentially reversible consequence of vasospasm, we started an infusion of nimodipine at a rate of 1 mg/h for the first hour and then 2 mg/h while continuing the phenytoin and chlormethiazole. No further seizures occurred, and three hours after the introduction of nimodipine she was responding to verbal commands and moving her arms and legs equally. By 36 hours after delivery she was fully conscious and neurological examination gave normal results except for short term loss of memory. The infusion of nimodipine was stopped and the drug was given orally at a dose of 60 mg every four hours for five days. The disseminated intravascular coagulation progressively improved. A magnetic resonance imaging scan obtained four days after the first scan showed substantial improvement with resolution of the changes in most areas (figure). She subsequently made a full recovery.

Comment

This case reaffirms earlier reports that the neurological manifestations of eclampsia can be the result of ischaemia, presumably secondary to vasospasm, rather than haemorrhage. It was particularly interesting that the ischaemia was extremely widespread, affected areas of the brain supplied predominantly by the posterior half of the circle of Willis, and included areas that are known to be vulnerable to hypoxic damage. Our experience of a single case allows us to draw only the most cautious conclusions about any relation between treatment and outcome. The clinical course reversed dramatically when nimodipine was started, and the abnormalities seen on magnetic resonance imaging resolved more rapidly than in the cases we have previously described.¹ If this drug was responsible for the sudden clinical improvement it may be relevant that it is a potent inhibitor of the tonic phase of contraction in the basilar artery induced by serotonin⁴; the platelet activation of pre-eclampsia and eclampsia probably entails substantial release of serotonin.⁵

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- 2 Lewis LK, Hinshaw DB, Will AD, Hasso AN, Thompson JR. CT and angiographic correlation of severe neurological disease in toxemia of pregnancy. *Neuroradiol* 1988;30:59-64.
- 3 Pickard JD, Murray GD, Illingworth R, et al. Effect of oral nimodipine on cerebral infarction and outcome after subarachnoid haemorrhage: British aneurysm nimodipine trial. *Br Med J* 1989;298:636-42.
- 4 Towart R. The selective inhibition of serotonin-induced contractions of rabbit cerebral vascular smooth muscle by calcium-antagonist dihydropyridines. *Circ Res* 1981;48:650-7.
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(Accepted 6 June 1990)

Axial T2 weighted images of brain (spin echo 2000/80). Left: image obtained before treatment, showing bilateral foci of high signal intensity in basal ganglia, right thalamus and insular cortex, and left temporal and parietal cortex extending into subjacent white matter; additional sections showed high signal intensity in pons, occipital lobes, and left cerebellar hemisphere. Right: image obtained four days later, after treatment with nimodipine, showing almost complete resolution of changes. Thin linear bands of high signal intensity remain at boundary of grey and white matter of previously affected areas

ONE HUNDRED YEARS AGO

If the demand for medicated wines were confined to those which are contained in the *Pharmacopæia* the retail chemist and druggist would find but very little difficulty in carrying on his business strictly within the limits of pharmacy, and there would be no occasion for him to become a wine merchant. The use of wine as a vehicle for the administration of certain drugs has increased to a great extent. These so-called medicated wines are advertised largely; many of them are by no means unpalatable, so that if there be any tendency to tipple the chemist's counter affords every facility.

These wines cannot be sold without a licence, for the Board of Inland Revenue has decided that a medicated wine must contain such an amount of drug as to render it unpleasant or fit only for use as a medicine. There is no doubt that it is the general desire of the trade, as evidenced by a discussion which took place at a meeting of the North British Branch of the Pharmaceutical Society on April 16th, that the business of a pharmacist should not degenerate into that of a publican. It is a matter which involves great difficulty to the chemist, for these wines are prescribed by medical men, and customers will expect to be supplied with them like ordinary medicines. (*British Medical Journal* 1890;ii:1085.)