Acute onset internuclear ophthalmoplegia responsive to treatment with intravenous alteplase

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Isolated pontine infarcts account for approximately 3% of ischaemic strokes in hospital registry studies.1 Symptoms may include sensory or motor power loss, involuntary movements (eg, palatal myoclonus, periodic limb movements), impairment of consciousness and emotional disturbances (eg, pathological laughing or crying). Internuclear ophthalmoplegia (INO) occurs due to dysfunction of the medial longitudinal fasciculus within the pons due to occlusion of paramedial branches of the basilar artery and is the main presenting feature in 0.5% of all ischaemic stroke patients.2 An INO is characterised by paralysis of the ipsilateral eye for all conjugate gaze movements and nystagmus of the contralateral eye when this eye is in abduction. Here we present the case of a young man presenting with acute INO which responded rapidly to treatment with intravenous alteplase.

Case report

A 29-year-old man with a past medical history of excess alcohol consumption, hypertension and gout presented with a one and a half hour history of sudden onset right-sided weakness and double vision. There had been no history of head or neck injury or demyelinating illness and he denied any illicit drug use. National Institutes of Health Scale (NIHSS) was 1 and was notable for an INO (Video 1).
Computed tomography of the brain with angiography did not demonstrate any evidence of ischaemia, haemorrhage nor large vessel occlusion/wall irregularity. He received alteplase at two hours and eight minutes following onset of symptoms. After 15 minutes, the INO resolved (Video 2).

Follow-up magnetic resonance imaging including diffusion weighted imaging (MRI-DWI) demonstrated normal appearances of the brain. Investigations to date including vasculitis screen, antiphospholipid screen, syphilis screen, human immunodeficiency testing and telemetry are unremarkable. He is currently awaiting a bubble echocardiogram.

**Discussion**

Recent worldwide trends show that stroke in patients aged 50 years and younger are increasing due to a number of factors, including increasing burden of classic and emerging risk factors, greater stroke awareness and access to brain imaging. Stroke in the young is of great importance given the major social and economic impacts at the peak of their most productive years. Urgent modern stroke treatment with intravenous alteplase and mechanical thrombectomy is very effective in improving functional recovery and survival.

Mild stroke is the most commonly cited reason for withholding alteplase in acute ischaemic stroke in those otherwise eligible for treatment. Patients with minor, non-disabling symptoms were excluded from large randomised control trials as the risk of haemorrhage was considered to be greater than the potential benefit. Prospective data suggest that 30% of such patients have functional disability when assessed at 90 days following stroke. Reasons for this include early worsening of symptoms, underappreciated symptoms and deterioration of medical co-morbidities.

There is limited data available about the prognosis from ischaemic INO. One case series showed that approximately one in five patients failed to recover from an INO. The decision to administer thrombolysis was a consensus between two experienced stroke physicians, both deeming the deficit functionally disabling. Further, the risk of haemorrhagic complications from treatment was considered to be very low due to the age of the patient, neurological deficit, imaging findings and time of onset to admission to hospital. Recently, the PRISMS trial, enrolled patients with an NIHSS <5 and non-disabling symptoms, randomised to aspirin or alteplase in a double-blind manner. It is unclear if any patients with an INO were included in the trial or whether
such a patient would have been eligible. The trial was stopped early due to slow recruitment and so it is difficult to draw conclusions form this trial, however final analysis did not demonstrate a significant benefit in functional outcomes at 90 days with alteplase.

The normal follow-up MRI could be expected in this patient. Though MRI-DWI is sensitive for ischaemic stroke, it may be falsely negative in almost one-third of patients with mild stroke (NIHSS <5).7 The key role of MRI in stroke is in localising pathology and clarifying pathophysiology, rather than simply diagnosis.

This case demonstrates the value of acute stroke therapy in highly selected patients with mild, yet disabling symptoms considered at low risk of complications.

Competing interests:
Nil.

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