Rare vascular complication of acute meningococcal meningitis in a child

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Accepted 7 September 2018

DESCRIPTION

A 5-year-old boy presented with fever for 4 days and acute-onset weakness of the right upper and lower limb for 1 day. There was no history of headache, seizures, vomiting and altered sensorium, rash or bleeding from any site. On examination, he had normal mentation, neck stiffness, Kernig's sign, right-sided upper motor neuron facial palsy and right hemiparesis. The rest of the systemic examination was unremarkable. A clinical diagnosis of acute meningitis with left Middle Cerebral Artery (MCA) territory stroke was made.

Cerebrospinal fluid examination revealed 980 cells/µL (90% polymorphonuclear leucocytes and 10% lymphocytes), glucose 47 mg/dL, proteins 110 mg/dL and *Neisseria meningitides* antigen was positive; however, no organism could be isolated on microscopy and culture. He was unimmunised for meningococcal vaccine. Blood culture was sterile. Detailed stroke and immune deficiency work-up was negative. MRI of the brain showed altered signal changes in left frontal lobe, anterior limb of the internal capsule, left caudate head and putamen (figure 1). MR angiography of intracranial vessels revealed attenuated left middle cerebral artery flow voids (figure 2). The child was started on intravenous ceftriaxone and oral aspirin in antithrombotic doses. At 6 months follow-up, he was asymptomatic and had no weakness.

Bacterial meningitis is a serious infection of central nervous system and *N meningitides* is one of the the most common aetiologies. Focal neurological deficit is seen in 5%–14% patients, and it results from vasculitis, transient vasospasm and septic thrombosis of intracranial arteries, cortical veins and dural venous sinuses, leading to the infarction of cerebral territories.[1] Vascular involvement in meningococcal meningitis secondary to vasospasm resulting from subarachnoid inflammation or vasculitis is rarely described in children; however, there are anecdotal reports in adults.[2] The radiological findings in index patients were suggestive of secondary vasculopathy pattern and it may be secondary to the underlying meningococcal meningitis. Post-meningitis vascular events usually present within the first week of illness and are commonly seen with *Streptococcus pneumoniae*, *N meningitides*, *Haemophilus influenzae* and *Mycobacterium tuberculosis*.[3] The treatment of vasculopathy includes oral aspirin in antithrombotic doses and heparin may be more effective in recurrent strokes or infarction. To conclude, acute-onset focal neurological deficit in a child with acute bacterial meningitis should raise a suspicion of cerebral vasculopathy.

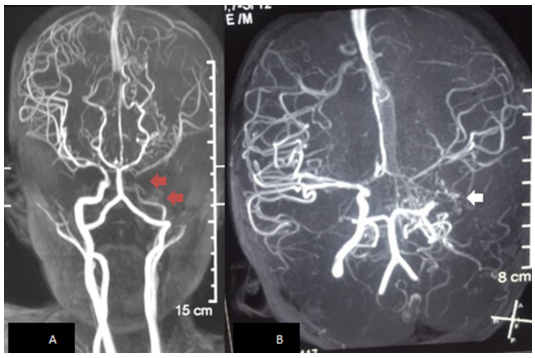

Figure 2 MR angiography of cerebral vessels. (A) Time-of-flight MR angiography shows attenuated cervical, petrous, cavernous and supraclinoid portion of left internal carotid artery (arrow). (B) Left middle cerebral artery and its branches are markedly attenuated with marked paucity of cortical branches and formation of collateral vessels (arrow). A1 segment of left anterior cerebral artery was also attenuated.

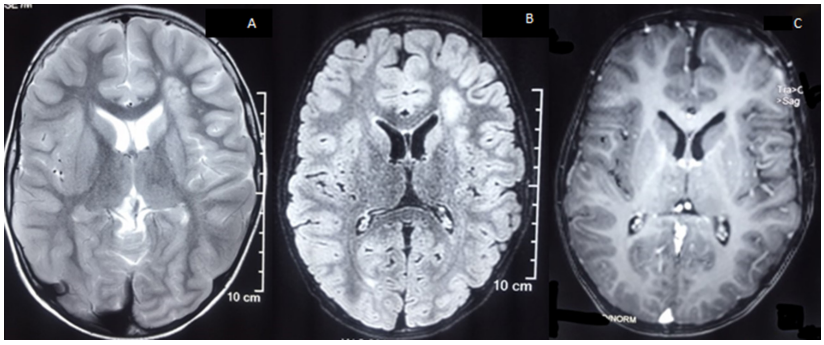

Figure 1 MRI of the brain. (A) T2-weighted and (B) fluid-attenuated inversion recovery axial scans showing subacute infarct involving left frontal cortex, anterior limb of internal capsule, left caudate head and putamen. (C) T1-weighted post-gadolinium axial images showing patchy contrast enhancement.

To cite: Sharawat IK, Subramani V, Kesavan S, *et al*. *BMJ Case Rep* Published Online First: [*please include* Day Month Year]. doi:10.1136/bcr-2018-227069

Learning points

- Bacterial meningitis is a serious infection of central nervous system and *Neisseria meningitides* is one of the most common underlying aetiology.
- Post-meningitis vascular events are rare and usually present within the first week of illness and are commonly seen with *Streptococcus pneumoniae.*
- The treatment of vasculopathy includes oral aspirin in antithrombotic doses and heparin may be more effective in recurrent strokes or infarction.

Contributors IKS: patient management, analysis of radiological data, literature review and initial draft manuscript preparation. VS and SK: patient management, literature review and initial draft manuscript preparation. LS: clinician-in-charge, critical review of manuscript for important intellectual content and final approval of the version to be published.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent Parental/guardian consent obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

1 Pathan N, Faust SN, Levin M. Pathophysiology of meningococcal meningitis and septicaemia. *Arch Dis Child* 2003;88:601–7.
2 Hsu SS, Kim HS. Meningococcal meningitis presenting as stroke in an afebrile adult. *Ann Emerg Med* 1998;32:620–3.
3 Czartoski T, Hallam D, Lacy JM, *et al*. Postinfectious vasculopathy with evolution to moyamoya syndrome. *J Neurol Neurosurg Psychiatry* 2005;76:256–9.