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CASE REPORT

Central Venous Sinus Thrombosis in a High-Altitude Climber at K-2, Pakistan

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ABSTRACT

Cerebral venous sinus thrombosis (CVST) is a rare condition affecting mountaineers in high altitude areas. We present a case of a 45-year-old male who presented with headache, nausea and visual impairment immediately after descent from K-2 mountain (8611 meters) in Pakistan. His neurological exam did not reveal any findings, CT scan brain was done which showed thrombosis in the superior sagittal sinus with associated wedge-shaped hemorrhage in the frontal lobe. He was managed conservatively on anticoagulation and was discharged subsequently.

KEY WORDS

High altitude, superior sagittal sinus thrombosis

INTRODUCTION

Pakistan is home to multiple high-altitude mountain ranges such as Himalayas, Karakoram and Hindukush, and boasts of five mountains above the 8000 metres mark. (1) K-2, the highest peak in the country and second highest in the world, attracts mountaineers from all over the world. High altitude climbing has been associated with a number of risks such as high-altitude pulmonary edema, high altitude cerebral edema, acute mountain sickness, barotrauma, exposure keratitis, sleep disorders etc. (2) Cerebral venous sinus thrombosis has been reported in literature previously at ranges from 2500 to 5500 m and is thought to be associated with dehydration and polycythemia but genetic predisposition to hypercoagulability states can result in thrombosis at even lower altitudes.(3) We present a case of cerebral venous sinus thrombosis after descent from K-2 and its subsequent management.

CASE PRESENTATION

A 45-year-old man presented with sudden onset of severe headache after descent from K2 mountain. He had a generalized headache, non-radiating, severity graded as 10/10 and was associated with persistent vomiting and visual blurring. His past medical history was significant for hypertension and occasional smoking. On arrival, he was hypertensive (BP 175/88), tachycardiac (Hr 102/min) otherwise maintaining saturations at room air. His systemic examination was unremarkable. Neuro exam showed did not reveal any motor or sensory deficits, GCS: 15/15. He had bilateral equal pupils reactive to light with no deficits in field of peripheral vision, but he reported generalized blurring of vision. Baseline lab investigations including CBC, electrolytes, creatinine and coagulation were unremarkable. Hypercoagulable studies were not done due to financial constraints. ECG revealed sinus tachycardia.

A CT scan of head with CTA was performed which showed filling defect in the superior sagittal sinus representing Dural sinus thrombosis with large wedge-shaped mixed density intra-parenchymal hemorrhage in frontal lobe causing mass effect on ipsilateral frontal horn of right lateral ventricle and midline shift of 5 mm towards left (Figure 1 and 2). The patient was diagnosed with CVST. Neurology and neurosurgery teams were taken on board and he was planned for conservative management with neuroprotective strategies such as blood pressure control, fluid hydration and anticoagulation. He was subsequently discharged.

DISCUSSION

This was a unique case presented to the emergency department with findings of cerebral venous sinus thrombosis and cerebral edema associated with high

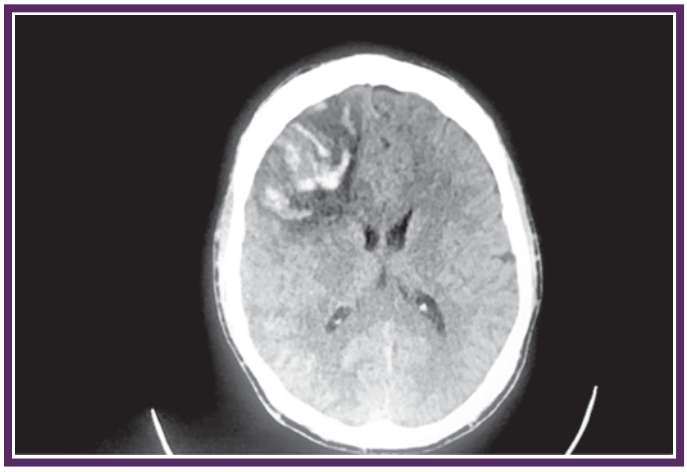

Figure 1: Mixed density intra- parenchymal hemorrhage in right frontal lobe

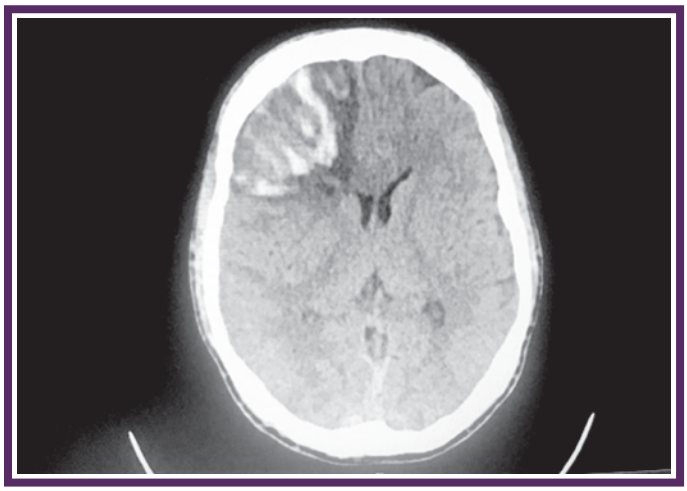

Figure 2: Mass effect on ipsilateral frontal horn of right lateral ventricle, sulcal effacement and midline shift

altitude. Recent literature indicates that CVST at high altitude is most commonly seen in males at a relatively younger age group (19-47 years) with some predisposition to hypercoagulability state.[3] Dehydration, immobility, lack of acclimatization, coagulation disorders and exposures to extreme cold can trigger the prothrombotic process and result in CVST. [4]

An analysis from Pakistan including 28 patients with CVST at high altitude shows that 32.1 % of patients were smokers, had high hemoglobin levels and D- Dimer level but had a good outcome.[5] A retrospective cohort of 21 patients from Nepal shows that 76 % of patients with CVST at high altitude had hypertension whereas 57% of them had diabetes mellitus.[6] Low molecular weight heparin is accessible in most low middle-income countries and is associated with good outcomes, but some patients may require surgical intervention.[6]

This case study suggests that there is a need to increase awareness about thrombotic conditions among general people, particularly those who live at high-altitude areas, climbers, hikers, bikers and mountaineers. It recommends that screening for patients may be carried out before visiting high altitude places that would help preventing this serious but treatable disorder at high altitude.

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