Sudden Bilateral Reversible Vision Loss: A Rare Presentation of Acute Intermittent Porphyria


Abstract
Acute intermittent porphyria is a rare disorder, characterised clinically by variable patterns of neurological and metabolic disturbances. We report a rare presentation with sudden onset painless bilateral reversible vision loss of cerebral origin along with a brief review of the underlying pathophysiology.

Introduction

Acute intermittent porphyria (AIP) is a rare autosomal dominant metabolic disorder resulting from a defect in the hepatic pathway of haeme biosynthesis. It can manifest as neurovisceral crises due to autonomic dysfunction consisting of symptoms like fever, tachycardia, abdominal pain, nausea, vomiting, constipation or diarrhoea and urinary retention or incontinence. Seizures, peripheral neuropathy and psychiatric manifestations can also be seen.

We report a very rare presentation of acute intermittent porphyria with sudden painless bilateral reversible vision loss.

Case Report

A 22 year old female was admitted in the surgery department with acute abdominal pain and vomiting. Patient’s haemogram, serum amylase and serum lipase were normal. Her abdominal ultrasound was unremarkable. The patient was treated with antibiotics, analgesic and antispasmodics. The pain did not improve and on the third day patient developed altered sensorium with sudden bilateral painless vision loss for which a neurology consult was taken. Detailed history revealed two episodes of similar type of abdominal pain in the past one year. On examination patient’s blood pressure was 190/110 mmHg. Neurological examination revealed disorientation to time, place and person; her visual acuity was significantly decreased to perception of light only and fundus showed bilateral papilloedema with preserved light reflex. Rest of the neurological examination did not reveal any lateralisng or localising signs. Patient was shifted under neurology care and on the same day she developed two episodes of generalised tonic clonic seizure, each lasting about 2-5 minutes. In view of the clinical profile, past history of abdominal pains and as her urine became darker on exposure to sunlight a provisional diagnosis of acute intermittent porphyria was considered. Her routine investigations and urine for porphobilinogen were sent and she was treated with intravenous dextrose, levetiracetam and labetalol. The urinary porphobilinogen levels were raised (26 mg/day). Routine baseline workup including haemogram, liver function, kidney function, serum electrolytes and calcium, chest X-ray, and ECG were normal. EEG showed a normal awake record. MRI showed cortical and subcortical hyper intensities in bilateral parieto-occipital lobes. Nerve conduction studies were normal. Administration of intravenous haematin was also considered but could not be used because of non-availability.

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Over the next ten days, she responded well to the treatment. Her blood pressure was controlled and had significant improvement in vision to 6/12. There was no further recurrence of seizure or pain abdomen. Follow up MRI brain done on day 14 showed near complete resolution of lesions.

Discussion

Acute intermittent porphyria results from deficiency of enzyme porphobilinogen desaminase (PBG-D), resulting in the accumulation and increased excretion of porphyrins and their precursors such as delta-aminolevulinic acid (ALA) and porphobilinogen (PBG). Many drugs (barbiturates, anticonvulsants, calcium channel blockers, sedatives, antibiotics, antifungals and hormones etc.) may activate the disease process. Stress, concomitant medical or surgical illness can precipitate a porphyric crisis. Diagnosis is based upon high urinary ALA and PBG levels. Macroscopically, accumulation of these precursors excreted in urine may change its colour after exposure to the sunlight, from yellowish to dark red or brown occasionally even to a purple tinge. AIP presenting as acute cortical blindness is rare. Kupferschmidt et al reported two such cases.

Our patient initially presented with autonomic dysfunction in form of abdominal pain and subsequently developed labile hypertension. This sudden elevation in systemic blood pressure resulted in development of hypertensive encephalopathy and reversible cerebral vasospasm due to loss of auto-regulatory capability of the brain vasculature. The vertebro-basilar system has poor sympathetic innervation hence is more commonly affected. Bilateral occipital or parieto-occipital affection is responsible for visual dysfunction. The MRI showed cortical and subcortical hyper intensities in bilateral parieto-occipital lobes. The above pattern was similar to that described in posterior reversible encephalopathy syndrome (PRES). The reversibility of these clinical features after control of hypertension, suggests that functional vascular changes and cerebral edema were the underlying mechanism rather than irreversible ischaemic changes, consistent with the diagnosis of PRES.

Several mechanisms have been postulated for the neurotoxicity seen in porphyria. Direct neurotoxicity due to accumulation of haeme precursors result in neuronal dysfunction. Vasospasm may also result from decreased biosynthesis of haeme with subsequent reduction of nitric oxide, which is a major vasodilator. Severe haeme deficiency during acute attacks may cause unopposed cerebral vasoconstriction due to a decrease in cerebral nitric oxide production.

The relationship of seizures to porphyria is complex. Seizures are reported in 10–20% of cases of AIP. Epileptic seizures in our patient may have been due to cortical involvement, commonly seen in PRES (88%) or worsening of porphyria itself which can cause seizures as a result of metabolic disturbance due to haeme deficiency. In addition, a potential direct epileptogenic effect of ALA has also been proposed. ALA at a low concentration has been shown to inhibit the release of α-aminobutyric acid (GABA) from nerve endings. In addition by acting as an agonist at GABA auto- receptors it also interacts with glutamate receptors to play a crucial role in the epileptogenesis related to porphyria.

In conclusion, the rare clinical presentation of acute vision loss along with signs and symptoms suggestive of autonomic dysfunction should raise clinical suspicion of AIP. The clinical course and MRI findings in our patient are consistent with PRES resulting from autonomic dysfunction. This case emphasises the varied spectrum of signs and symptoms with which porphyria “the little imitator” can present. The importance of early diagnosis and appropriate treatment is the key factor in the reversibility of the pathophysiology before irreversible ischaemic changes occurs.

References


