Case Report

Extra Pontine Myelinolysis without Striatal involvement Presenting as Pathological Crying, Reversible Parkinsonism and Dystonia

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Abstract

A case of Central Pontine Myelinolysis and Extrapontine Myelinolysis presented with dystonia, Parkinsonism, and pathological crying that developed few days after gradual correction of hyponatremia. EEG slowing was evident before onset of symptoms, and disappeared with clinical improvement. Thalamic lesions alone produced these features. It dramatically responded to the Trihexyphenidyl therapy. Thus, basal ganglia involvement is not mandatory to produce this clinical picture; early onset of symptoms, resolution of EEG slowing and prompt response to anticholinergics may indicate better prognosis.

Key Words: *Exrapontine Myelinolysis, Pathological Crying, Parkinsonism, Dystonia.*

Introduction

Extrapontine myelinolysis (EPM) occurs in about 40% cases and approximately 60% patients have evidence of both central (CPM) and extrapontine lesions[1]. Extrapyramidal symptoms are rare in these cases and most commonly seen with involvement of the striatum and caudate nucleus[2-4]. The prognosis is usually grave.

We are describing a case of CPM and EPM who presented with predominant features pathological crying, Parkinsonism and dystonia without radiological involvement of striatum and responded dramatically to anticholinergic treatment.

Case

A 45 year old female was hospitalized with the complaints of uncontrolled crying on trivial stimuli, inability to eat and speak due to jaw clenching, tremors and rigidity of body. Consciousness, attention & verbal comprehension were normal. The patient showed drooling of saliva, facial dystonia (grimacing), facial hypomimia, aphonia, rigidity and oromandibular dystonia on examination. Pseudobulbar crying and Parkinson tremors involving the facial muscles and chin were present off and on. Quadriparesis (4+) was evident with bilateral extensor planter response. Deep tendon reflexes could not be examined due to extreme rigidity. Serum electrolytes, complete hemogram, blood sugar, serum calcium, EEG, MRI Head and CSF examination was ordered. Hemogram, serum calcium, blood sugar, serum electrolytes and CSF examination were within normal limits. EEG showed generalized delta-theta slowing (Fig. 1). T1, T2 and Diffusion Weighted MRI was done, that showed evidences of CPM (Fig 1), with hyper intensities in bilateral thalamus, external capsule and right hippocampus. However, striatal nuclei were normal bilaterally (Fig 1) and there was no mid-brain lesion. The Neuro-radiologist made the diagnosis of the CPM with EPM.

Past History demonstrated another admission in the hospital 12 days back with the complaints of headache, dizziness, weakness, tremulous movements whole body that were starting from the right side of face and gradually progressing to the lower side. She was also complaining of the tingling sensations of the body. The neurological

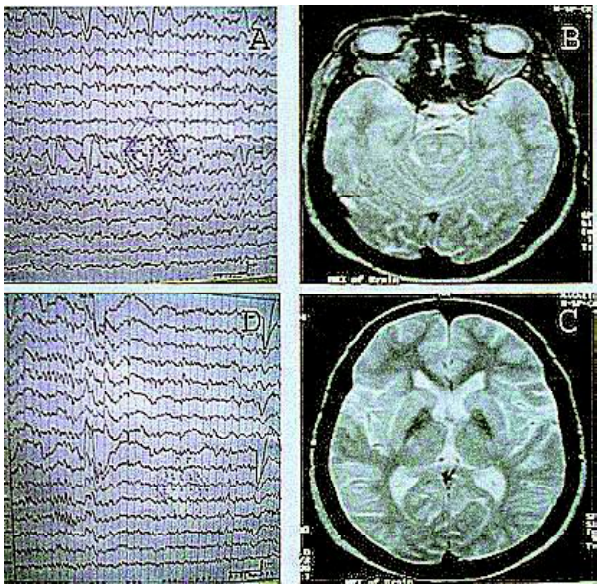

Fig. 1(A) EEG showing background slowing delta to theta rhythm with poor response to eye opening. (B) T2 weigted axial MRI showing bilateral hyperintensities in pons. (C) T2 axial MRI showing bilateral hyperintesities in thalamus and external capsule. (D) EEG showing normalization of background alpha rhythm with response to eye opening after clinical recovery.

examination was non-remarkable during first admission except for slight weakness (power 4+) in all limbs. In the background of history (see below) and clinical examination, serum electrolytes were done and hyponatremia (Serum Na^+ 100 mmol/L) and hypokalemia (Serum K^+ 2.7 mmol/L) was found during previous admission. CT scan did not reveal anything. A diagnosis of drug-induced hyponatremia was made. Diuretics and oxcarbazepine were discontinued. Serum sodium was corrected gradually over 5 days with oral supplementation and she was discharged with good recovery.

Further more, she was a known case of hypertension, recurrent transient ischemic attacks and seizures and was on atenolol 50 mg/day, aspirin 150 mg/day and oxcarbazepine 600-mg/ day in divided doses. Family history disclosed presence of recurrent major depressive disorder episodes in two of her siblings with good response to SSRI.

During present admission, she was treated with trihexyphenydil 6 mg/ day in three divided doses to control the rigidity. She responded dramatically and within a single day, the crying stopped, oromandibular dystonia decreased, facial grimacing and hypomimia improved. After two days, she was able to sit on the wheel chair, could swallow liquid, and started talking. The dose of Trihexyphenidyl was escalated to 10mgs/ day in three divided doses. Within next five days, her speech became clear, and she started having solid food. After 7 days, intensity of rigidity decreased and it changed to cogwheel type. Tremors remained only in tongue. At this moment, deep tendon reflexes appeared brisk, planter bilaterally extensor but the power did not improve; thus, UMN signs were unmasked after resolution of Parkinson features and dystonia. The EEG was repeated and it showed re-appearance of normal alpha background and reactivity to eye opening (Fig. 1).

Discussion

Though we corrected hyponatremia gradually after admission, even then we cannot rule out the possibility of persistent hyponatremia before admission. Whether the rapid correction of hyponatremia is the only cause of CPM/ EPM is a debatable issue. Cases are known that developed CPM/ EPM without hyponatremia[5], with gradual correction of hyponatremia[3,6,7], with persistent hyponatremia[7,8], and hypernatremia or its aggressive therapy[9,10]. Diuretics are known to induce CPM and EPM by inducing hyponatremia and hypokalemia[6]. These evidences favour that hyponatremia can act as a precipitating factor, as in our case.

In our case symptoms appeared after eight days of correction of hyponatremia. The syndrome can develop immediately i.e., after 3 days[11], or may be delayed (3 weeks to 5 months)[4,12] after onset of hyponatremia. Thus it shows that not only the present hyponatremia but also the history of hyponatremia is important clue to the diagnosis and should be given due consideration. However, we did not have any laboratory evidence for the same in our patient, except for the assumption because of presence of predisposing factors.

The patients usually have lesion restricted to the central pontine area[4-7,11,13,14], but may extend to involve the extrapontine areas e.g., corpus-striatum[3,4,10,12], deep layers of cerebral cortex[6], midbrain, sub-thalamic nucleus, internal capsule, amygdala, lateral geniculate body, white matter of cerebellar folia[8], cerebellar vermis[10] and thalamus[8-10]. Involvement of hippocampal region and external capsule has been reported in three children[10].

External capsular involvement is also known[9]. EPM without CPM may also be present[1]. In this case few of the mentioned areas were involved but not the striatum. Diffuse slowing on EEG in a series of patients that developed CPM and EPM has been reported[11]. We had the similar findings, which is most likely due to the thalamic involvement.

Pseudobular affect has been described to be associated with strokes located in anterior and middle cerebral artery territory, pontine base and medullary lesions[15]. A review suggested that it may be associated with damage to motor structures including internal capsule, substantia nigra, cerebral peduncles and pyramidal tracts and usually seen in stroke, dementia, motor neuron disease, multiple sclerosis, head injury and rarely central pontine myelinolysis[16].

Tremors and cogwheel rigidity have been described in patients with pontine-putamen[4] and pontine-midbrain and thalamic lesions[17]. Dystonia and Parkinson features can occur in EPM with[3,12] or without involvement of striatum[14]. The thalamic involvement is sufficient to produce these symptoms like in Japanese Encephalitis. This was also seen in our case. From our case, we assume that absence of striatal and midbrain involvement may be a better prognostic indicator.

The prognosis has been consistently found grave, and recovery takes months[3,13], but Karp and Laureno[11] reported improvement after two weeks that continued for a year. We have seen the pattern of improvement similar to the latter case. Improvement in tremors[4], and to tremors, rigidity and hypokinesia[17] to l-dopa therapy has been reported. We used the anticholinergic agent and the patient showed remarkable recovery in few days. However, we could not find any report of efficacy of anticholinergics in this syndrome. Similarly, literature suggests that pseudobulbar affect may respond to tricyclic anticholinergics, selective serotonin reuptake inhibitors often within 2-3 days of therapy. L-dopa and amantadine has also been tried with some response[16]. However, efficacy of anticholinergics in its treatment has never been reported. Hence, good prognosis can be expected in few cases even with anticholinergics.

To conclude, pseudobulbar affect may be associated with CPM-EPM with varied etiology, presentation and course. Strong suspicion at the outset leads to the correct diagnosis. Early normalization of EEG slowing, absence of striatal involvement and good response to anticholinergics may be the indicators of better prognosis.

References

1. Martin RJ. Central pontine and extrapontine myelinolysis: The osmotic demyelination syndromes. J. Neurol Neurosurg Psychiatry 2004; 75 : 22-28.
2. Sadeh M, Goldhammer J. Extrapyramidal syndrome responsive to dopaminergic treat-ment following recovery from central pontine myelinolysis. Eur Neurol 1993; 33 : 48-50.
3. Seiser A, Schwarz S, Aichinger-Steiner Mm, Funk G, Schnider P, Brainin M. Parkinsonism and dystonia in central pontine and extrapontine myelinolysis. J Neurol Neurosurg Psychiatry 1998; 65 : 119-121.
4. Sullivan AA, Chervin RD, Albin RL. Parkinsonism after correction of hyponatremia with radiological central pontine myelinolysis and changes in the basal ganglia. J Clin Neurosci. 2000; 7 : 256-259.
5. Bernsen HJ, Prick MJ. Improvement of central pontine myelinolysis as demonstrated by repeated magnetic resonance imaging in a patient without evidence of hyponatremia. Acta Neurol Belg 1999; 99 : 189-193.
6. Meyer P, Jouanny P, Laurain MC, Bollaert PE, Braun M, Mallie JP, Jeandel JP. Central pontine myelinolysis: apropos of an oligo-symptomatic form. Rev Med Interne 1994; 15 : 282-286.
7. Pradhan S, Jha R, Singh MN, Gupta S, Phadke RV, Kher V. Central pontine myelinolysis following 'slow' correction of hyponatremia. Clin Neurol Neurosurg 1995; 97 : 340-343.
8. Victor M, Ropper AH. Principals of Neurology. New York: The Mc Graw- Hill Companies, Inc. 2001.
9. Achiwa S, Ando K, Ishikura R, Takada Y, Takahashi Y. A case of extrapontine myelinolysis precipitated by correction of a hyper-osmolar state. Nippon Igaku Hoshasen Gakkai Zasshi. 2004; 64 : 310-312.
10. Brown WD, Caruso JM. Extrapontine myelinolysis with involvement of the hippocampus in three children with severe hypernatremia. J Child Neurol. 1999; 14 : 428-433.

11. Karp BI, Laureno R. Pontine and extrapontine myelinolysis: a neurologic disorder following rapid correction of hyponatremia. Medicine 1993; 72 : 359-373.
12. Maraganore DM, Folger WN, Swanson JW, Ahlskog JE. Movement disorders as sequelae of central pontine myelinolysis: report of three cases. Mov Disord. 1992; 7 : 142-148.
13. Lawson B, Silva J. Central pontine myelinosis and hyponatremia. Clinical case. Rev Med Chi. 2001; 129 : 427-432.
14. Tison FX, Ferrer X, Julian J. Delayed onset movement disorder as a complication of central pontine myelinosis. Mov Disord 1991; 6 : 171-173.
15. Kim JS, Choi-Kwon S. Poststroke depression and emotional incontinence: correlation with lesion location. Neurology 2000; 54 : 1805-1810.
16. Schiffer R, Pope LE. Review of pseudobulbar affect including a novel and potential therapy. J Neuropsychiatry Clin Neurosci 2005; 17 : 447-454.
17. Hirano F, Makino I, Kimura K, Narita S. A case of parkinsonism due to pontine and extrapontine myelinolysis. Rinsho Shinkeigaku, 1992; 32 : 1006-1012.