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White Cerebellum Sign is a Rare Finding Representing an Irreversible Hypoxic-Ischemic Injury: A Case Report

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Abstract

Background: White cerebellum sign is a rare and ominous radiological finding on CT-Scan brain in patients with severe anoxic-ischemic brain damage. It is usually seen in patients with global brain anoxia usually due to extra-cranial causes.

Case presentation: We present a rare case of an elderly male who presented with headache, drowsiness and history of complex partial seizures for two days before admission. On investigations, CPK was raised. All other tests including complete blood picture, liver function tests, renal function tests, serum electrolytes and urine routine examination were normal. CT-Scan brain plain showed white cerebellum sign along with diffuse cerebral edema.

Conclusion: The diagnosis of white cerebellum sign was made, and patient was managed accordingly. Patient's family was counseled about poor prognosis and outcomes of patient.

Keywords: ***Complex partial seizures; White cerebellum sign; Anoxic brain injury; Cerebral edema***

1. Background

White cerebellum sign is a rare entity seen in patients with severe anoxic brain injury. There are various theories postulated as a cause of this sign, but confirmatory cause is not identified yet. It is usually seen in childhood and it is usually associated with poor outcome.

Here we present a case of an elderly male who presented with this rare sign.

2. Case Presentation

A 63-year-old male with pre-morbids of diabetes mellitus, hypertension, and epilepsy (complex partial seizures type) was on treatment for known pre-morbids, presented with complain of worsening headache and deteriorating conscious level and focal fits for two days before presentation. Patient had complex partial seizures that includes recurrent focal fits of right side of body for 40 minutes duration associated with decreased conscious level. There was no history of up-rolling of eyes, urinary or fecal incontinence and frothing from mouth. At presentation, patient had Glasgow coma scale of 3/15, pupils were fixed and dilated, and planters were bilaterally upgoing. Patient was hypotensive and bradycardiac with shallow respiration. Patient was intubated and put on ventilatory support along with inotropic support. His complete blood picture, liver function tests, renal function tests, serum electrolytes, serum calcium, serum magnesium, serum phosphate, serum albumin, blood sugar levels, C-reactive protein and urine routine examination were within normal limits. Arterial blood gases were also normal. CPK was 1205 U/L (60 - 190U/L). CT-Scan brain plain was done which showed white cerebellum sign along with diffuse cerebral edema. There was no evidence of infection and patient was then managed symptomatically with cerebral decongestants and anti-epileptics. Patient remained on ventilatory and inotropic support for 3 days and then patient expired on 4th day. Patient's family was counseled about poor prognosis and worse outcomes (FIG. 1).

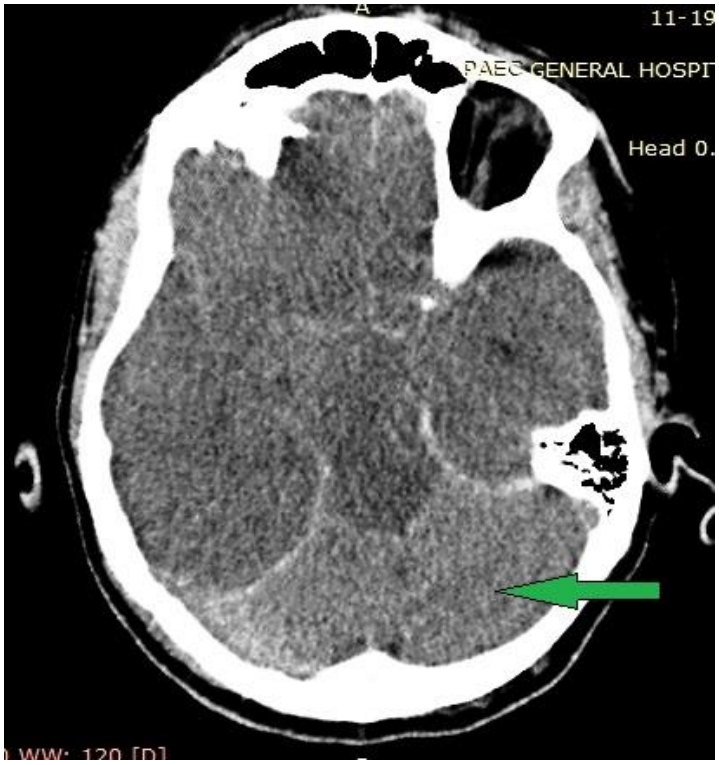

FIG. 1. **Axial CT-Scan image showing white cerebellum sign with diffuse cerebral edema.**

3. Discussion

This patient was diagnosed as a case of white cerebellum sign which is a rare entity. He presented in status epilepticus with headache and decreased conscious level. He was managed conservatively, and family was counseled in detail.

To best of the author's knowledge, most of the cases published up to date, patients usually presented with white cerebellum sign have a pediatric age group and had history of trauma or birth asphyxia. This patient had two rare features that includes his old age and cause was status epilepticus.

White cerebellum sign is a rare neuroimaging finding which is usually seen in children with severe hypoxic brain damage [1-4]. White cerebellum sign is also named as dense cerebellum sign [5]. It usually represents severe and irreversible anoxic neuronal damage that results in global cerebral ischemia [1,3,6]. It is usually documented in pediatric age group following drowning or trauma leading to hypoxic brain injury [5]. Case reports published till yet showed that it is an imaging finding usually associated with birth asphyxia, head injury, drowning, status epilepticus, meningo-encephalitis, and post-cardiac arrest asphyxia [3-5].

Specific appearance of this sign on CT-Scan brain is due to generalized hypodensity of supra-tentorial structures as compared to cerebellum which retains its normal density and appear hyerdense [1]. Various hypothesis has been postulated regarding as the cause of this rare condition which includes distention of deep medullary veins due to obstruction by increased intra-cranial pressure that results in cerebral edema, relative preservation of posterior circulation blood flow and hypoxia induced damage to sodium pump results in more severe damage to metabolically active areas including supra-tentorial structures i.e., cerebrum and basal ganglia [1,4]. This sign is important from diagnostic, therapeutic and prognostic side as treatment is primarily symptomatic and aimed to decrease intra-cranial pressure [5]. Emergency nurses and doctors should know this rare sign as it is and indicator of poor prognosis and worse outcomes [1,3,6-8] and one-third of patients presenting with this sign usually die. Only one patient mentioned by Chalela JA in his study who survived after diagnosed with white cerebellum sign [5]. Overall, surviving patients usually suffer severe and permanent brain damage [7].

4. Conclusion

White cerebellum sign is an unusual finding mostly seen in pediatric patients with history of birth asphyxia or trauma. Early diagnosis of this sign is important to avoid un-necessary investigations and prolonging the patient's misery. It is also important from prognostic viewpoint and family counseling.

5. List of Abbreviations

CT-Scan: Computed Tomographic Scan; CPK: Creatine Phosphokinase

6. Consent for Publication

Consent for publication was obtained.

7. Ethical Approval

Institutional approval was obtained in compliance with regulation of our institution and generally accepted guidelines governing such work.

8. Conflicts of Interest

No conflict of interest with any institution / organization.

9. Funding

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