

# A Delicate Diagnostic of Posterior Reversible Encephalopathy Syndrome (PRES) Revealed by Repetitive Convulsions in a 14-Year-Old Child: A Case Report and Review of the Literature

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**How to cite this paper:** Milinganyo, E.W., Koffi, L., Ahouangansi, E., Gore, L.Y., N'cho, N., Bouaffo, A., Blagon, R., Mayunga, G.T., N'simbo, A.A., Kalau, W.A., Fefe, R.I. and Yikpe, D.A. (2024) A Delicate Diagnostic of Posterior Reversible Encephalopathy Syndrome (PRES) Revealed by Repetitive Convulsions in a 14-Year-Old Child: A Case Report and Review of the Literature. *Open Journal of Pediatrics*, **14**, 1006-1011. <https://doi.org/10.4236/ojped.2024.146096>

**Received:** August 6, 2024

**Accepted:** September 4, 2024

**Published:** September 7, 2024

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## Abstract

**Background:** Rare pathological conditions are frequently a diagnostic challenge in intensive care. Posterior-reversible encephalopathy syndrome (PRES) is a clinical and imaging diagnosis recently individualized. It occurs in various conditions such as collagenosis or vasculitis of the central nervous system, electrolytic disorders and the use of cytotoxics or immunosuppressive treatment. It is responsible for non-specific neurological manifestations such as confusion, coma, convulsions or visual disturbances. The diagnosis is suggested by brain magnetic resonance imaging (MRI). The lesions correspond to vasogenic edema and are therefore generally reversible after etiologic treatment and control of blood pressure. **Aim:** This clinical case aims to show the diagnostic complexity of rare pathologies in the intensive care unit. **Case presentation:** We present a case of a 14-year-old child received in the pediatrics department for generalized tonic-clonic convulsions with tongue biting in a febrile context. Malaria was negative, with hyperleukocytosis, slightly elevated C-reactive protein, anemia and hypokliemia, lumbar puncture was performed and all cerebrospinal fluid examinations revealed nothing. The seizures were controlled by titrated cumulative doses of diazepam with a total of 12mg, antibiotic therapy with ceftriaxone, corticotherapy with dexamethasone 12mg and blood transfusion without any improvement in his condition. He was then transferred to intensive care where the clinical and paraclinical assessment highlighted a neurological deficit

Glasgow coma scale of 12/15 and biological hyponatremia. Brain CT-scan was normal. Hydroelectrolytic equilibration was undertaken, antibiotics continued, anti-comital prophylaxis and general resuscitation measures were provided. He regained consciousness on the 3<sup>rd</sup> day. On the 4<sup>th</sup> day, he presented high blood pressure and on the 5<sup>th</sup>, a resumption of convulsions without any obvious biological disorder, cerebrospinal fluid control was once more non-pathological. An MRI was performed and revealed Posterior-reversible encephalopathy syndrome. **Conclusion:** Posterior-reversible encephalopathy syndrome is a rare disease. It is necessary to keep rare diseases in mind.

## Keywords

Posterior-Reversible Encephalopathy Syndrome (PRES), Convulsion, Child, Intensive Care Unit

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## 1. Introduction

The intensive care unit remains a paradigm of rare pathologies culminating in often unusual syndromes. Rare pathological conditions are frequently a diagnostic challenge in intensive care [1].

Posterior-reversible encephalopathy syndrome (PRES) is a clinical and imaging diagnosis described in 1992 and highlighted in 1996 by Hinchey. An increasing gain of interest is recently remarked [2] [3].

It occurs in various conditions such as collagenosis or vasculitis of the central nervous system, electrolytic disorders and use of cytotoxics or immunosuppressive treatment [4], also in obstetrical hypertensive disorders such as preeclampsia or eclampsia or in the context of sepsis, renal disease or autoimmune disorders and even after transfusion [5]-[7].

It is responsible for non-specific neurological manifestations such as confusion, coma, convulsions or visual disturbances.

The diagnosis is suggested by brain magnetic resonance imaging (MRI) which shows at the early stage typically bilateral and symmetrical lesions of the parieto-occipital lobes in the form of hyperintensities in T2 and fluid-attenuated inversion recovery (FLAIR) sequences. The diffusion coefficient is normal or slightly elevated at this stage. These lesions correspond to vasogenic edema and are therefore generally reversible after etiologic treatment and control of blood pressure [8]. In some cases, MRI shows hyperintense lesions with reduced diffusion coefficients due to associated ischemic lesions that are responsible for cytotoxic edema. These lesions can be responsible for irreversible sequelae [9].

The treatment is symptomatic and determined by the underlying condition [6].

## 2. Case Presentation

A 14-year-old child weighing 40 kgs was transferred to intensive care coming from the pediatrics department. He was transferred for management of meningo-

encephalitis with altered consciousness.

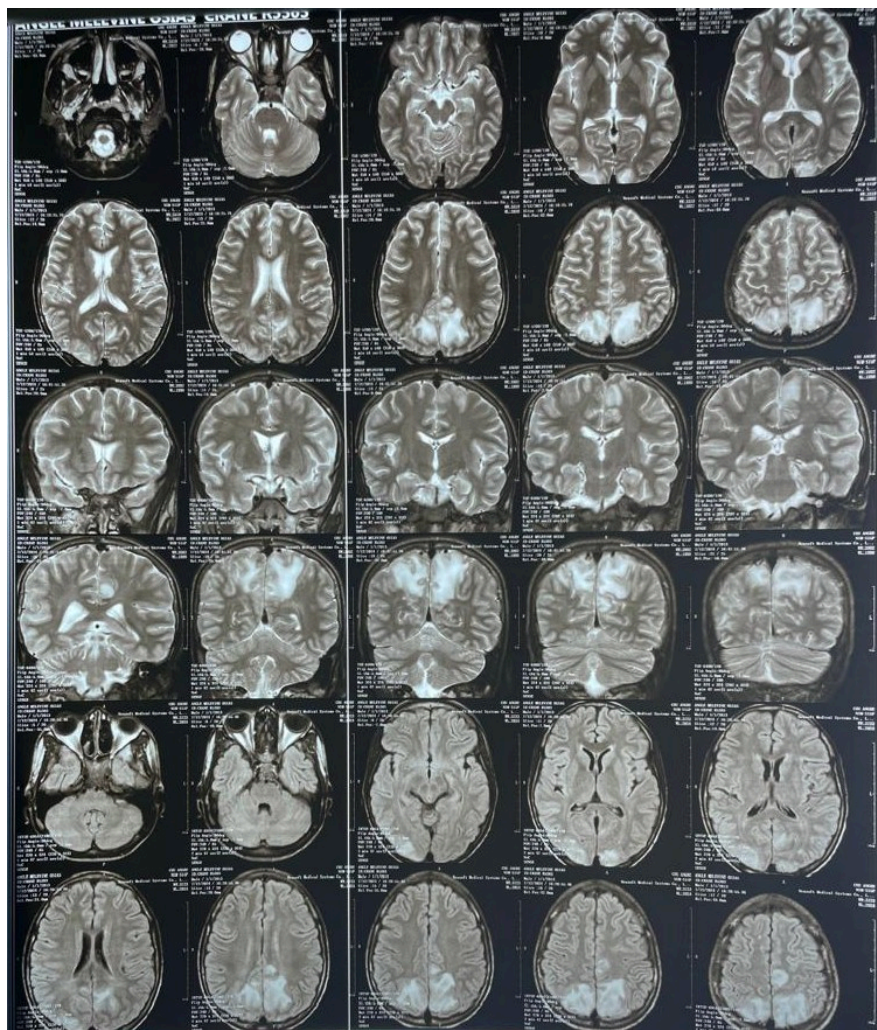
His symptomatology began 3 days before a fever self-medicated with paracetamol by his parents. Two days after, he convulsed and was immediately taken to the university hospital for appropriate care.

He was received by the emergency pediatrics team and the initial assessment revealed a still conscious patient. The biological assessment found no malaria, hyperleukocytosis  $16500/\text{mm}^3$ , anemia 8 g/dl, hypokaliemia 3.2 mEq/l. cerebrospinal fluid examination found nothing and the initial cerebral CT-scan was normal.

He was treated as having infectious meningoencephalitis.

He received antibiotics: ceftriaxone 1 g/12 hours, corticosteroid therapy: dexamethasone 12 mg/day and transfusion of 444ml of packed red blood cells.

After four days of well-conducted treatment, he restarted psychomotor agitation followed by progressive alteration of the state of consciousness. He was immediately taken to the intensive care unit.



**Figure 1.** Posterior reversible encephalopathy syndrome on cerebral IRM, T2 sequences, fluid-attenuated inversion recovery (FLAIR) and diffusion. Occipital and parietal lobes lesions.

The initial assessment in intensive care highlighted a neurological deficit: Glasgow coma scale of 12/15 and biological hyponatremia and hypokaliemia. The second cerebral CT-scan came back normal.

The treatment of meningoencephalitis continued with the addition of gentamycin 160 mg daily for three days. Hydroelectrolytic equilibration was undertaken; anticommital prophylaxis was assured by clonazepam 0.1mg/kg in oral drink for four doses per day.

After 3 days in the intensive care unit his state of consciousness had completely recovered and the clinical assessment discovered hypertension that we managed with nicardipine. The biological assessment returned normal. A multiplex PCR diagnostic found no evidence of infection.

On the 5<sup>th</sup> day in ICU he presented convulsions of the right half of his body associated with muscle spasms. A cerebral MRI was performed and revealed Posterior-reversible encephalopathy syndrome. He was put on sodium valproate 250mg thrice a day and clobazam 5mg tablet once a day.

He progressed well and was released from the intensive care unit 3 days later with satisfactory clinical and imaging checks (**Figure 1**).

### 3. Discussion

Posterior-reversible encephalopathy also is an increasingly recognized clinicoradiological condition associated with various medical presentations. In many cases the diagnosis and is really challenging.

PRES is characterized by a variety of symptoms such as headache, erratic mental status, seizures, visual abnormalities, etc. Medical imaging finds posterior cerebral white matter abnormality [10].

It's important to note that even though the majority of cases exhibit bilateral changes, approximately 5% present unilateral alterations [11].

Despite its name, PRES is not always reversible and doesn't always exclusively involve the posterior white matter [12]. The reversibility of lesions depends on their severity and the rapid adequate therapeutic management.

The predisposing factors of PRES in our patient were:

- An inflammatory state;
- Electrolytic disorders;
- An occasional hypertension;
- Blood transfusion.

#### 3.1. Epidemiology

PRES is a rare pathological condition. It occurs at any age from infant to elderly, but most frequently affects young or middle aged adults. Women seem to be more concerned than men.

#### 3.2. Which Exploration to Perform for Diagnostic

PRES may develop at any age from infant to elderly, but most frequently affects

young or middle aged adults. Women seem to be more concerned than man.

MRI of the brain assists with confirming the diagnosis of PRES and in showing its extent. It is therefore preferred to CT scan due to its superior resolution, especially of posterior fossa structures. Nevertheless, CT scan is usually the first form of imaging acutely and often diagnoses the pathology.

The typical CT scan and MRI features of PRES include almost symmetrical hemispheric vasogenic edema affecting subcortical white matter and often extending to the overlying cortex, best seen on MRI with fluid-attenuation inversion recovery (FLAIR) sequences [13].

MRI diffusion-weighted imaging usually confirms vasogenic edema with the absence of restricted diffusion. Post contrast enhancement occurs in 38% - 50% of patients [14]-[16] in one of three patterns: a leptomeningeal pattern, a cortical pattern within regions of altered FLAIR signal or a combined pattern.

### 3.3. Management

Management of PRES includes addressing hypertension removing offending agents when possible and anti-epileptic medication [17].

### 4. Conclusions

We suggest that PRES should be kept in mind in children presenting seizures with an inflammatory state, electrolytic disorders, an occasional hypertension and those that have had a blood transfusion.

In complex situations, an MRI is important for diagnosis.

Early and well-conducted management gives good results.

### Acknowledgements

The authors would like to thank their colleagues and the nursing staff for their contributions.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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