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Posterior Reversible Encephalopathy Syndrome in a Patient with Eclampsia

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Abstract

Background: Posterior reversible encephalopathy syndrome (PRES) is a clinical and neuroradiological condition associated with variable predisposing risk factors including preeclampsia and eclampsia. Cerebrovascular events in preeclampsia/eclampsia encompass a spectrum of severity, with reversible vasogenic edema at one extreme and irreversible cytotoxic edema and cerebral ischemia at the other.

Case report: A 24 years old woman was admitted in the Infectious Diseases department with a Glasgow coma scale of 5-6. She was a healthy primigravida with a singleton pregnancy. However, at week 27 of pregnancy after evaluating her health condition (systolic pressure 170 mm Hg and diastolic blood pressure 105 mm Hg, with edema of the feet and ankles and a highly fluctuating tension, severe swelling of the hands and face) and the poor development of fetus, the obstetricians decided to terminate the pregnancy. The next day she developed altered mental status and two episodes of generalized tonic-clonic convulsions without neurological deficit. She was transferred to intensive care unit of Infectious Disease Service. The Magnetic Resonance Imaging (MRI) performed after seizures showed subcortical bilateral hypersignals in T2 and FLAIR in left temporal and bilateral occipital lobes. According to clinical, image and laboratory findings we defined the case as Posterior Reversible Encephalopathy Syndrome in a patient with eclampsia. Treatment consisted of supportive therapy. The patient was discharged from the

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hospital after thirty-four days in relatively good condition.

Conclusion: Patients with eclampsia and preeclampsia may present with PRES and MRI is essential for the diagnosis. Treatment is mainly supportive but crucial in treating the underlying causes.

Keywords: Posterior Reversible Encephalopathy Syndrome, Eclampsia, Abortion, Pregnancy, Magnetic Resonance Imaging, Albania

INTRODUCTION

Posterior reversible encephalopathy syndrome (PRES) is a clinical and neuroradiological syndrome defined by the vasogenic edema which is caused by the blood-brain barrier integrity alteration. It was first described in 1996 (1). Since then and until today, various authors have written about this syndrome. In our country for the first time this term has been articulated by the team of Infectious Diseases and imaging physicians in 2020 (2).

Preeclampsia and eclampsia which are multi-systemic disorders of pregnancy and puerperium are variable predisposing risk factors of PRES (3). PRES is also associated with several medical conditions like autoimmune diseases, immunosuppressive therapy, renal and liver failure, post-transplantation, blood transfusion, infection, sepsis and shock. Infectious diseases constitute a no less important cause of PRES syndrome. Legriel et al cite human immunodeficiency virus as a cause associated with PRES Syndrome, while Muco et al cite Hantaan virus as another infectious cause associated with this pathology (2,4).

Symptoms include nausea, vomiting, headache, vertigo and tinnitus, ataxia, focal neurological defects, cerebellar syndrome, acute arterial hypertension/blood pressure fluctuations, impaired visual acuity, peripheral facial paralysis, altered sensorium while seizures and status epilepticus are common. Mentioned above preeclampsia is a key factor of PRES syndrome. Preeclampsia is defined by the presence of new-onset hypertension (>140/90 mmHg) and occurrence of proteinuria after the 20th week of gestation while severe pre-eclampsia is defined as systolic pressure ≥ 160 mm Hg and diastolic blood pressure of ≥ 110mm Hg with proteinuria of 2gm/dl, along with clinical features of severe headache, blurring of vision, epigastric pain and oliguria (5). Convulsions appearing in a pregnant woman or after giving birth are characteristic of eclampsia. Incidence of eclampsia is 1 in 2000 to 3250 deliveries in developed countries (6,7).

Published data suggest that cerebrovascular events in preeclampsia/eclampsia encompass a spectrum of severity, with reversible vasogenic edema at one extreme and irreversible cytotoxic edema and cerebral ischemia at the other, and the severity of the imaging findings correlates with the clinical severity (8). On the other hand, MRI is the type of examination that plays a key role in diagnosing this pathology. After treating the cause factor, the radiological changes disappear, and this happens in most cases. Permanent cerebral damage that will be followed by more serious neurological problems may occur in a much more limited number of patients. Data on this syndrome in our country are scarce. Therefore, we aimed to describe this pathology and at the same time inspire other colleagues to continue further research.

CASE REPORT

We presently report the case of a 24 years old woman who was hospitalized at the Infectious Diseases Department with a Glasgow coma scale

of 5-6. She was a healthy primigravida with a singleton pregnancy. At week 24 of pregnancy, she had edema of the feet and ankles and a highly fluctuating blood pressure. At week 27 of pregnancy, she was admitted to the emergency unit of obstetrics and gynecology department for severe hand and face swelling and high blood pressure (systolic pressure 170 mm Hg and diastolic blood pressure 105 mm Hg). After evaluating her health condition and the poor development of the fetus, the obstetricians decided to terminate the pregnancy. An induced late abortion was performed. She didn't have any risk factors associated with preeclampsia nor a family history of preeclampsia or heart diseases. Her medical history was negative for hypertension, diabetes or autoimmune disorders. In the next day of hospitalization, she developed fever (39°C), vomiting, nausea and headache. Afterwards she developed altered mental status and two episodes of generalized tonic-clonic convulsions in a row but without any neurological deficit. She was transferred to the intensive care unit of Infectious Disease Service. The physical findings included: blood pressure 170/110mmHg; heart rate 109 beats/min; respiratory rate 23 breaths/min; room air saturation 98%. Urine analysis showed albuminuria (7.6gr) and hematuria (20-30cell/field). Haematochemical parameters showed: White blood cells 15600 cells/mm3; Red blood cells 3.440000 cells/mm3; Hemoglobin 9.6 g/dl; Platelet count 505000 cells/mm3; Lactate dehydrogenase 504 U/L; total protein 5.5g/dL; low serum albumin level 2.3g/dL; Creatine phosphokinase 2249 U/L; aspartate aminotransferase 147 IU/L; alanine aminotransferase 160 IU/L; Urea 64mg/dl; Partial thromboplastin time 23.2%; C reactive protein was 34.6 mg/L, Fibrinogen 642mg/dL. Also, oliguria (300 ml/day) was present. Lumbar puncture showed 4 white blood cells/mm3. Three blood cultures were positive for Enterococcus species. The electroencephalogram showed alteration related to brain electrical activity "Intermittent bilateral slow wave on C-T-T-O in a background of low amplitude registration" (fig.1).

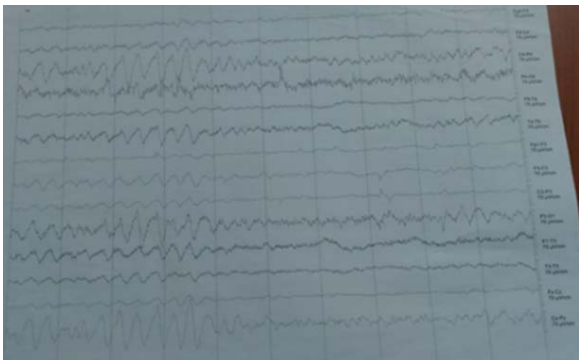

Figure 1. The electroencephalogram shows problems related to the electrical activity of the brain: Intermittent bilateral slow wave on C-T-T-O in a background of low amplitude registration

Chest X-ray was normal. The cardiac echography was negative for vegetations. In these circumstances she underwent a brain magnetic resonance imaging (MRI) without contrast enhancement which showed subcortical hypersignals in T2 and in Fluid-attenuated inversion recovery (FLAIR) sequences in left temporal and bilateral occipital lobes, without

diffusion restriction of signal and without micro-hemorrhages in T2* sequences (Fig.2,3).

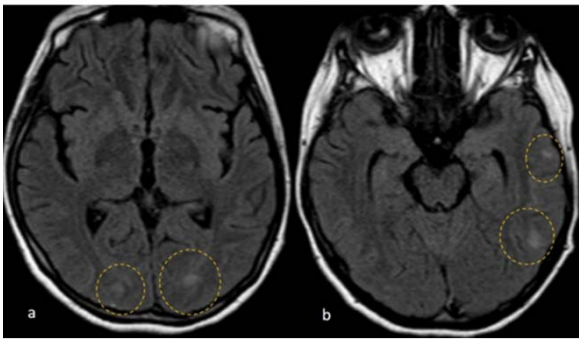

Figure 2. Axial FLAIR: Bilateral subcortical hypersignals (discontinuous yellow lines) which correspond to vasogenicoedema located in: a. bilateral occipital lobes and b. left temporal lobe

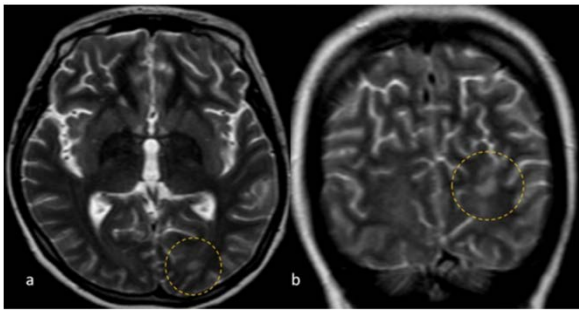

Figure 3. a. axial T2 image and b. coronal T2 image showing a discrete subcortical hypersignal in left occipital region which corresponds to vasogenicoedema (discontinuous yellow lines)

These pathological images were suggestive of Posterior Reversible Encephalopathy Syndrome (PRES). Treatment consisted of supportive therapy with Ceftriaxone, corticosteroids, anti-epileptic, saline infusions, electrolytes, antipyretics and oxygen therapy. The patient was discharged from hospital after thirty-four days in a relatively good condition.

DISCUSSION

This is one of the few works by Albanian doctors that scientifically sheds light on such an interesting syndrome. Our case was diagnosed at the University Hospital Center “Mother Teresa”, the only tertiary medical institution in Albania. For about a quarter of a century various authors have studied and presented this pathology in their articles. Meanwhile, we have tried to contribute at least to its further recognition. Our first article belongs to 2020 where we noted PRES syndrome associated with Hemorrhagic Fever (2). PRES as a clinical and neuroradiological condition is associated with several medical conditions. Eclampsia and preeclampsia are pathologies associated with PRES syndrome. The word "eclampsia" is from the Greek term for lightning. The first known description of the condition was by Hippocrates in the 5th century BCE (9). Eclampsia affects about 1.4% of deliveries while pre-eclampsia is estimated to affect about 5% of deliveries (10). According to a study of Bembalgi et al., the incidence of PRES is higher in primigravida patients (81%) than in multigravida patients (19%) and is higher in younger patients (81% cases between 20-25 years old group) (11). Our case was a 24 years old woman and primigravida. She developed headache, fever (39°C), vomiting, nausea and afterwards she had altered mental status and two episodes of generalized tonic-clonic convulsions one after the other. Brewer et al. in their study showed that the headache was present in 87% of cases with PRES and eclampsia (12). On the other hand, we can say

that most patients with clinical and radiological manifestations of this syndrome are hypertensive. The blood pressure of our patient was 170/105 mmHg. There is a wide range of neurological manifestations that often involve generalized seizures, sometimes complicated by status epilepticus in addition to headaches, confusion, nausea, vomiting and visual disturbances. There may be a focal neurological deficit, such as cortical blindness, cerebellar syndrome, or hemiparesis. These presentations may lead to coma (13). Typical signs of PRES are best detected by T2- weighted and fluid-attenuated inversion recovery (FLAIR) MRI, which is the golden standard for the diagnosis (14). Edema in the white matter of the brain mainly in the parietal-occipital lobes of the cerebral hemisphere is the main imaging finding on MRI. Our case had edema involving subcortical left temporal and bilateral occipital lobes. If promptly recognized and treated, the clinical syndrome usually resolves within a week and the changes seen in magnetic resonance imaging (MRI) resolve over days to weeks (15). This study also shows the association of PRES syndrome with eclampsia. We noted the importance of diagnosis and treatment in such a difficult and serious case. We are aware that this is neither the first nor the last case, so we aimed to describe it to inspire other colleagues to continue further research.

CONCLUSION

Patients with eclampsia and preeclampsia may present with PRES and MRI is essential for the diagnosis. Diagnostic procedures and timely medical treatment of this pathology are of great value.

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Conflict of Interest Statement: The authors declare that they have no conflict of interest.

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