Clinical Image

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A child with leukemia and behavioral changes

Clinical Presentation

A 12-year-old Saudi girl, known case of T-cell leukemia with CNS relapse. She was diagnosed 2 years ago. Multiple cycles of chemotherapy had been used (Fludarabine, Cytarabine, Methotrexate, Cyclosporine, and Mercaptopurine). She was admitted electively for cord blood transplantation. Afterward, she developed visual, and behavioral change followed by seizure.

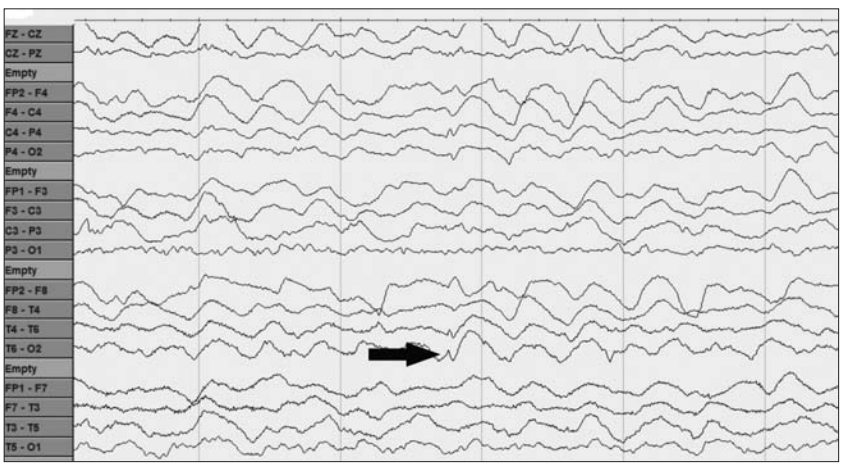

Figure 1 - Epoch of EEG (bipolar montage) of the patient.

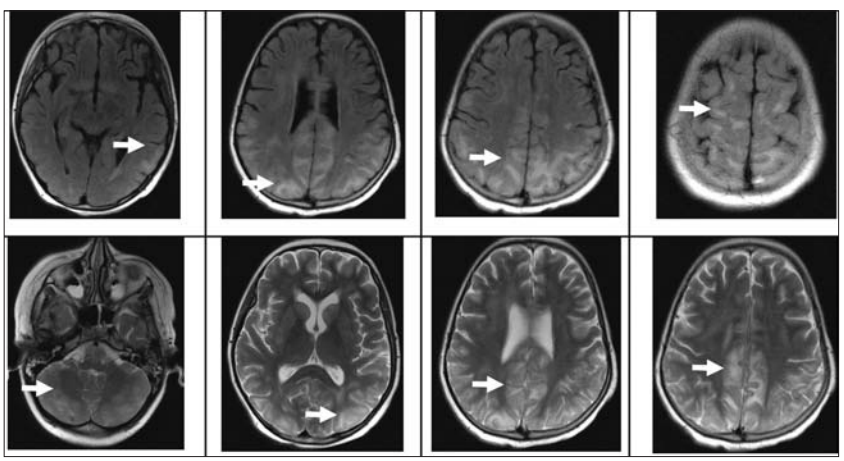

Figure 2 - Brain MRI showing high signal intensity lesions on both FLAIR (upper row) and T-2 weight images (lower row) in the cortical and subcortical white matter bilaterally with predominant involvement of the parieto-occipital region.

Clinical Image

Questions:

1. Describe the EEG epoch (**Figures 1 & 2**), which was immediately carried out after her first seizure?

2. What is your differential diagnosis?

3. What is the next step?

4. Describe the possible EEG changed in patients presented with PRES?

5. What is the treatment and prognosis?

Answers & Discussion

1. The EEG shows an asymmetrical slow background with prominent slowing on the right posterior head, with active spikes on the right side.

2. The differential diagnoses for the scenario presented include: Posterior reversible encephalopathy syndrome (PRES). Progressive multifocal leukoencephalopathy (PML), and space occupying lesions at the posterior aspect of the cerebral hemisphere (tumors and toxoplasmosis). In addition, other forms of encephalitis and chronic infections such as TB should be included.[1,2]

3. Magnetic resonance imaging was carried out, which showed bilateral cortical and sub cortical diffused high signals intensities on T2 and flair images. The occipital and parietal lobes are more affected than the frontal and temporal lobes. These changes were not enhancing on gadolinium administration.

4. The EEG changes may include diffuse background slowing in the theta or delta range, dysrhythmic intermittent theta activity, focal rhythmic activities, focal sharp-wave, and periodic lateralizing epileptiform discharges (PLEDs). These EEG findings will normalize after the clinical manifestations disappear.[3]

5. It is important to treat patients as soon as possible to prevent complications, and to avoid the risk of irreversible damage. The treatment is based on recognizing, and withdrawing the triggering factors. In our case, chemotherapeutic agents, especially cyclosporine, are the culprit cause. Steroids are not useful. In critical patients, admission to the ICU, and stabilization of hemodynamics are required. Patient with seizures should be treated with antiepileptic drugs according to current guidelines.[1]

References

1. Moon JM, Chun BJ. Reversible posterior leukoencephalopathy syndrome. ***J Emerg Med*** 2010; 38: e1-e4.
2. Covarrubias DJ, Luetmer PH, Campeau NG. Posterior reversible encephalopathy syndrome: prognostic utility of quantitative diffusion weighted MR images. ***AJNR Am J Neuroradiol*** 2002; 23: 1038-1048.
3. Kastrup O, Gerwig M, Frings M, Diener HC. Posterior reversible encephalopathy syndrome (PRES): electroencephalographic findings and seizure patterns. ***J Neurol*** 2012; 259: 1383-1389.