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ENCEPHALOPATHY: A COMPREHENSIVE CASE SERIES OF FIVE PATIENTS WITH MRI INSIGHTS.

Radio-Diagnosis

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ABSTRACT

Encephalopathy encompasses a variety of brain dysfunctions caused by factors such as metabolic imbalances, toxins, infections, or ischemia. It presents with symptoms like confusion, cognitive changes, and motor deficits. Radiological imaging, particularly MRI, is crucial for diagnosing encephalopathy, revealing abnormalities like edema, ischemia, or metabolic changes. Common findings include hyperintensities on T2-weighted and FLAIR images, and restricted diffusion on DWI, which help identify specific causes such as hypoxic-ischemic or metabolic encephalopathies. Early diagnosis through imaging is essential for appropriate treatment and management.

KEYWORDS

Neuroimaging, Encephalopathy, Brain disorders

INTRODUCTION

Encephalopathy refers to a broad range of brain dysfunctions that can result from various causes, including metabolic disturbances, toxins, infections, hypoxia, and structural brain damage. In radiology, encephalopathy is assessed through various imaging modalities, to identify underlying causes such as structural lesions, ischemic changes, or metabolic disturbances affecting brain function.

AIM AND OBJECTIVES

Recognize and describe key imaging signs that help identify specific forms of encephalopathy, enabling precise diagnosis through radiological methods.

Develop an understanding of the distinct imaging features that differentiate one type of encephalopathy from another, enhancing diagnostic accuracy.

Expand awareness of the diverse clinical signs and symptoms of encephalopathy, and how these can correlate with radiological findings to form a comprehensive clinical picture.

Apply radiological knowledge to guide clinical decisions, assisting in the development of targeted treatment strategies for patients with various encephalopathies

METHODS AND MATERIALS

- In this section, we present five characteristic cases that were referred to our institute, where patients underwent brain MRI and were diagnosed with different types of encephalopathies.
- Brain MRI scans were performed using a Siemen, 1.5 Tesla machine, with the administration of gadolinium contrast.

CASES AND DISCUSSION

Case 1: Hepatic Encephalopathy

- A 42-year-old female presented to the emergency department with altered mental status and jaundice for the past 9 days.
- An MRI scan of the brain was performed which showed areas of altered signal intensity, which appear hyperintense on FLAIR (Fluid-Attenuated Inversion Recovery) and Diffusion-Weighted Imaging (DWI), are observed in the **splenium of the corpus callosum**.

Case 2: Posterior Reversible Encephalopathy Syndrome (PRES)

- A 34-year-old woman presented to the emergency department with the chief complaint of 4 episodes of convulsions.
- An MRI of the brain revealed multiple regions of increased signal intensity on T2-weighted (T2W) and FLAIR images, affecting the cortex and subcortical white matter in the bilateral posterior temporo-parietal and occipital lobes.

Case 3: HIV Encephalopathy

A 37-year-old female, seropositive for HIV, came to the outpatient department (OPD) with primary complaints of weakness in both lower limbs and confusion. She was not receiving antiretroviral therapy.

- An MRI of the brain revealed multiple small, discrete, poorly defined areas of increased signal intensity on FLAIR images, affecting the subcortical and deep periventricular white matter in the bilateral fronto-parietal region.

Case 4: Drug Induced Encephalopathy

- A 68-year-old male presented with generalized weakness for the past 14 days, slurred speech for 3 days, loss of appetite for 12 days, persistent abdominal pain for 20 days, and three episodes of fever within the last 24 hours. His medical history includes a hepatic abscess, and he has been taking Metronidazole.
- An MRI of the brain revealed axial FLAIR images showing bilateral symmetrical areas of increased signal intensity along the dorsal part of the brainstem and in the dentate nuclei. Diffusion-weighted imaging (DWI) also showed restricted diffusion in the splenium of the corpus callosum.

Case 5: Posterior Reversible Encephalopathy Syndrome (PRES)

- A 27-year-old female, with a history of multiple pregnancies, had a generalized tonic-clonic seizure following childbirth. Once the seizures resolved and she started to regain awareness, she began experiencing a headache and reduced vision in both eyes.
- An MRI of the brain showed multiple focal areas of increased signal intensity on T2-weighted (T2W) and FLAIR sequences, involving the cortex and subcortical white matter across the bilateral fronto-parietal, posterior temporal, and occipital lobes. Additionally, some of these regions exhibited hyperintense signals on Diffusion-Weighted Imaging (DWI), suggesting possible restricted diffusion.

RESULTS

Out of the 5 cases,

- One was diagnosed with Hepatic encephalopathy.
- Two were diagnosed with Posterior Reversible Encephalopathy Syndrome (PRES).
- One was diagnosed with HIV encephalopathy.
- One was diagnosed with drug induced encephalopathy.

CONCLUSION

- Radiologists play a crucial role in narrowing down the diagnosis by recognizing distinct imaging features, such as symmetry, characteristic topographic distribution, and enhancement patterns of lesions.
- Encephalopathies can be diagnosed through a comprehensive assessment of the brain's imaging patterns and signal abnormalities. However, for an accurate diagnosis, it is essential to integrate radiological findings with the patient's clinical history and laboratory results.

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