Non-alcoholic Wernicke’s encephalopathy- Role of MRI in diagnosis and follow up
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A 27-year-old woman came with bilious vomiting and abdominal pain for the past 4 days and two episodes of abnormal movements of hands and feet associated with uprolling of eyes and tongue bite followed by altered behaviour. She was conscious, oriented, with hypotonia and absent power in all four limbs.

Symmetrical T2 and FLAIR hyperintensities in the hypothalamus, medial thalami, periaqueductal grey matter, mammillary bodies, lateral walls of the 3rd ventricle and bilateral frontal gyri. There were few focal bright areas in diffusion weighted study involving bifrontal cortex. No significant post-contrast enhancement seen in these lesions. Post treatment follow up MR imaging was done after 15 days which showed significant reduction of the T2 and FLAIR hyperintensities.

Wernicke’s encephalopathy is a medical emergency which occurs due to acute deficiency of thiamine and presents with neuropsychiatric manifestations [1].

Wernicke’s encephalopathy is an eponymical disease named after Dr Carl Wernicke who described the classical triad of its clinical manifestation consisting of ocular signs, altered consciousness, and ataxia [2].

The classical clinical triad of Wernicke’s encephalopathy described by Dr Carl is present only in 10 % of the presenting cases [3].

Imbalance of thiamine, the body stores of which take approximately 6 weeks to get exhausted, induces various biochemical and metabolic changes [4].

The clinical manifestations of the disease also include loss of appetite, nausea and vomiting, fatigue, apathy, giddiness, insomnia, anxiety, amnesia for immediate past, confusion, disorientation, hallucinations and even coma [5].

Chronic alcohol abuse is the most common cause of Wernicke’s encephalopathy [6] however, few cases of non-alcoholic Wernicke’s encephalopathy have also been reported [7, 8].

The manifestations of Wernicke’s encephalopathy can occur with normal circulating thiamine levels as most of thiamine is in the stored form and is used in glucose metabolism [9].

MRI is a sensitive tool in diagnosing Wernicke’s encephalopathy. Oedema of cytotoxic and vasogenic origin is the
most characteristic neuroimaging finding of acute Wernicke encephalopathy [10].

In acute Wernicke’s encephalopathy symmetric involvement of brain is noted, typical findings being increased T2 and decreased T1 signal surrounding the aqueduct and third ventricle, medial thalamus, the tectal plate, periaqueductal gray matter and mamillary bodies [11].

The atypical findings of Wernicke’s encephalopathy are symmetrical distribution of hyperintense lesions in cerebellar dentate nuclei, tegmentum of the lower pons, red nuclei, and tectum of the midbrain [12, 13]. Contrast enhancement can be present in the lesions, frequently in the mamillary bodies which is more often seen in alcoholic patients. Enhancing mamillary bodies can sometimes be the only sign of Wernicke’s encephalopathy [7]. Gadolinium enhanced studies are hence advocated in this condition.

In Wernicke's encephalopathy, involvement of the cortex on imaging is rare and this finding if present carries a poor prognosis [14].

Patients in whom Wernicke's encephalopathy is suspected, thiamine should be initiated either intravenously or intramuscularly as early as possible to ensure adequate absorption [15].

The MRI findings revert following treatment with thiamine [16].

This is a medical emergency and requires early diagnosis and treatment. Failure to diagnose and initiate adequate treatment at the correct time in the form of parenteral therapy may even cause loss of life in 20% of cases; 75% will be left with permanent brain damage known as the Korsakoff's Psychosis [17].

**Differential Diagnosis List:** Non-alcoholic Wernicke's encephalopathy, Artery of percheron infarct, Metronidazole induced encephalopathy, Creutzfeldt-Jacob disease., Deep cerebral venous thrombosis

**Final Diagnosis:** Non-alcoholic Wernicke’s encephalopathy

**References:**


Description: MRI FLAIR sequence axial section at the level of midbrain showing hyperintensity in the peri aqueductal grey matter and bilateral mamillary bodies. Origin: Department of Radiodiagnosis Father Muller Medical College Mangalore India
**Description:** MRI FLAIR sequence axial section at the level of thalamus showing hyperintensity in the medial thalami and lateral walls of the third ventricle. **Origin:** Department of Radiodiagnosis Father Muller Medical College Mangalore India
Description: MRI FLAIR sequence axial section at the supraventricular level showing hyperintensity in the bilateral frontal gyri. Origin: Department of Radiodiagnosis Father Muller Medical College Mangalore India
Description: MRI T2W sequence axial section at the level of mid brain showing hyperintensity in periaqueductal grey matter Origin: Department of Radiodiagnosis, Father Muller Medical College, Mangalore, India
Description: MRI T2W sequence axial section at the level of thalamus showing hyperintensity in the medial thalami and lateral walls of the third ventricle Origin: Department of Radiodiagnosis, Father Muller Medical College, Mangalore, India
Description: MRI T2W sequence axial section at the supraventricular level showing hyperintensity in the bilateral frontal gyri. Origin: Department of Radiodiagnosis, Father Muller Medical College, Mangalore, India.
Figure 3

Description: MRI DW sequence axial section at the supraventricular level showing restriction at the bilateral frontal gyri

Origin: Department of Radiodiagnosis, Father Muller Medical College, Mangalore, India
Description: MRI T1 contrast enhanced axial section at the level of midbrain showing no evidence of abnormal contrast enhancement. Origin: Department of Radiodiagnosis, Father Muller Medical College, Mangalore, India.
Description: MRI T1 contrast enhanced axial section at the level of thalamus showing no evidence of abnormal contrast enhancement  

Origin: Department of Radiodiagnosis, Father Muller Medical College, Mangalore, India
Description: MRI FLAIR sequence axial section at the level of midbrain showing significant reduction of hyperintensity in the peri aqueductal grey matter Origin: Department of Radiodiagnosis, Father Muller Medical College, Mangalore, India
Description: MRI FLAIR sequence axial section at the level of thalamus showing significant reduction of hyperintensity in the bilateral thalami and lateral walls of third ventricle.

Origin:
Department of Radiodiagnosis, Father Muller Medical College, Mangalore, India
Description: MRI T2 sequence axial section at the level of thalamus showing significant reduction of hyperintensity in the bilateral thalami and lateral walls of third ventricle. Origin: Department of Radiodiagnosis, Father Muller Medical College, Mangalore, India.