Images in Medicine

ID: IJARS/2015/13595:2041

Radiology Section

Wernicke's Encephalopathy: MRI Features

RAMAKRISHNA NARRA, MARY VARUNYA JEHENDRAN, SUSEEL KUMAR KAMARAJU

Keywords: Mamillary bodies, MRI, Tectal plate, Thalami, Wernicke encephalopathy

CASE DESCRIPTION

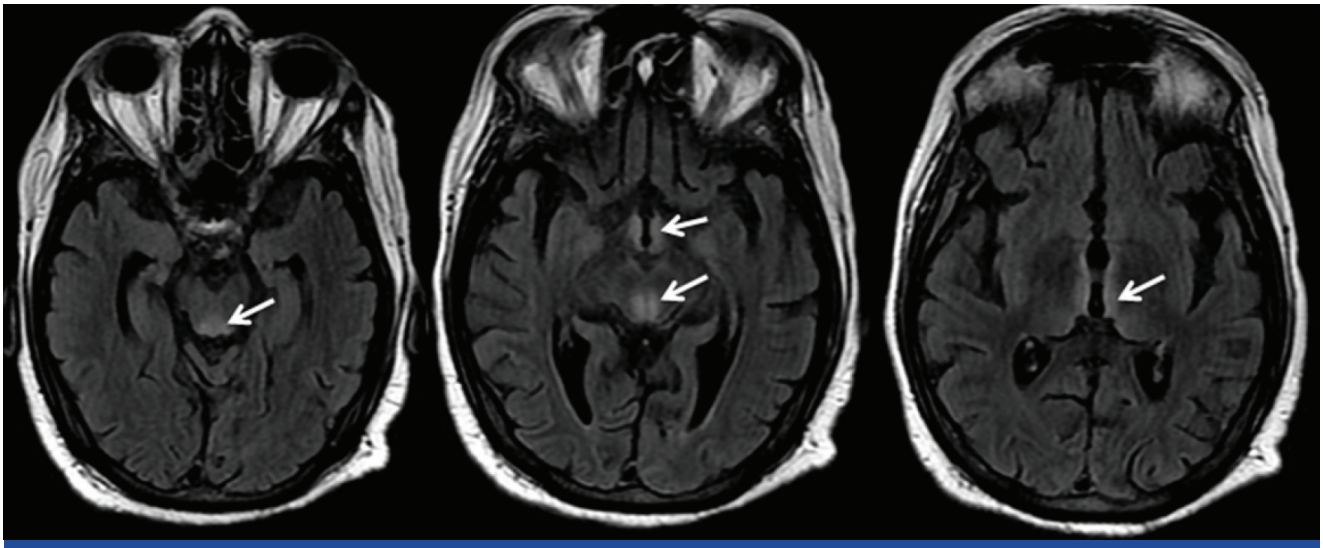
A 42-year-old male was brought to the department of neuroradiology with the clinical complaint of altered mental status, disorientation and somnolence since one day. He was an alcoholic since 10 years. His hematological work up, blood glucose, liver function tests and renal function tests were within normal limits.

MRI was performed and it revealed hypointensity in the periaqueductal grey matter on T1 weighted images and hyperintensities in the bilateral medial thalami, mamillary bodies, periaqueductal grey matter and tectal plate on both FLAIR [Table/Fig-1] and T2 weighted images. In addition there was diffuse cerebral atrophy.

The characteristic distribution of lesions in the bilateral medial thalami, mamillary bodies, periaqueductal grey matter and tectal plate helped us to clinch the diagnosis of Wernicke's encephalopathy [1]. Patient recovered well with intravenous thiamine therapy.

Wernicke's encephalopathy is an acute neurological emergency that has a better prognosis when diagnosed early. It is caused by the deficiency of thiamine which may be due to chronic alcoholism, tumours of the gastrointestinal tract, gastric bypass [2] or bariatric surgery, anorexia nervosa, parenteral therapy etc. Thiamine in the form of esters takes part in glucose metabolism and in the production of neurotrasmitters. Deficiency therefore leads to loss of osmoregulation across cell membranes causing swelling of the intracellular and extracellular spaces.

The hallmark clinical features include the triad of altered consciousness, ophthalmoplegia and ataxia. This triad is observed in only 16-38 % of cases, making Wernicke's encephalopathy a largely underdiagnosed entity. Although the imaging features are quite characteristic, complete hematological, biochemical (serum electrolytes, blood glucose, liver function tests) workup should be performed to exclude other causes of altered mental status [3].



[Table/Fig-1]: Sequential Axial FLAIR images of the brain show hyperintensity in the tectal plate, mamillary bodies, periaqueductal grey matter and medial aspects of bilateral thalami (Arrows)

Imaging helps in arriving at a diagnosis with the typical MRI features being symmetric areas of altered signal intensities in the bilateral thalami, mamillary bodies, tectal plate and periaqueductal region. Involvement of the mamillary bodies is seen more often in alcoholic than other patients. Atypical MR imaging features include symmetric alterations of the cerebellum, vermis of cerebellum, cranial nerve nuclei, red nuclei, dentate nuclei, caudate nuclei, splenium of corpus callosum, and cerebral cortex. Atypical MRI findings are characteristic of non alcoholic Wernicke's encephalopathy while the typical MRI features are characteristic of alcoholic Wernicke's encephalopathy [2].

The role of diffusion, ADC and MR spectroscopy are unclear needing further research.

Differential diagnosis for the typical imaging appearances of Wernicke's encephalopathy include artery of percheron infarct, deep cerebral vein thrombosis, primary acute disseminated encephalomyelitis, cytomegalovirus encephalitis.

Even mere clinical suspicion of the diagnosis warrants treatment with intravenous thiamine. Delay in treatment leads to permanent neurological deficits.

Learning Points/Take Home Messages

- MRI helps in confirming the diagnosis of Wernicke's encephalopathy and helps in excluding other causes of encephalopathy
- MRI findings are classified into typical and atypical findings. Typical MRI features are characteristic of alcoholic Wernicke's encephalopathy whereas atypical MRI features are suggestive of nonalcoholic Wernicke's encephalopathy.

ACKNOWLEDGEMENT

Dr Adinarayana Mandapalli MD (Radiology).

REFERENCES

[1] Zuccoli G, Pipitone N. Neuroimaging findings in acute Wernicke's encephalopathy: review of the literature. *American Journal of Roentgenology*. 2009;192(2):501-08.
[2] Zuccoli G, Cruz DS, Bertolini M, Rovira A, Gallucci M, Carollo C, et al. MR imaging findings in 56 patients with wernicke encephalopathy: nonalcoholics may differ from alcoholics. *American Journal of Neuroradiology*. 2009;30(1):171-76.
[3] Escobar A, González M, Aguayo G, García-Ramos GS. Acute Wernicke's encephalopathy. Comparison among the clinical features, magnetic resonance images and neuropathology findings. *Revista Mexicana de Neurosiencia*. 2009;10(3):224-31.

AUTHOR(S):
1. Ramakrishna Narra
2. Mary Varunya Jehendran
3. Suseel Kumar Kamaraju

PARTICULARS OF CONTRIBUTORS:
1. Associate Professor, Department of Radiology, Katuri Medical College and Hospital Chinnakondrupadu, Guntur, Andhra Pradesh, India.
2. Resident, Department of Radiology, Katuri Medical College and Hospital Chinnakondrupadu, Guntur, Andhra Pradesh, India.
3. Professor, Department of Radiology, Katuri Medical College and Hospital Chinnakondrupadu, Guntur, Andhra Pradesh, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Ramakrishna Narra, Associate Professor, Department of Neuroradiology
E-mail: narra.ramki29@gmail.com

FINANCIAL OR OTHER COMPETING INTERESTS:
None.

Date of Publishing: **Apr 10, 2015**