

Evidence Discussion

Autoimmune/Paraneoplastic Encephalitis & Neuroinflammatory Disorders (HD-14.3)

- The American College of Radiology (ACR) Appropriateness Criteria® provides guidance on the appropriateness of CT versus MRI Brain in certain clinical scenarios relating to altered mental status. For acute, undifferentiated presentations and with focal symptoms, CT head is an appropriate modality, but with known intracranial process, suspected medical illness or toxic-metabolic etiology, and/or psychosis, MRI Brain, is appropriate and in some cases may be preferable.¹
- In the appropriate clinical scenarios, recognition of structural and functional imaging patterns of brain involvement using CT head, MRI brain, and brain PET, in autoimmune encephalitis (including paraneoplastic and non-rheumatologic inflammatory disorders) can facilitate rapid access to appropriate treatment, as well as avoid invasive diagnostic procedures such as brain biopsy.²
- FDG-PET/CT brain performed at a median 4 weeks of symptom onset was more often abnormal than initial MRI, EEG, or laboratory cerebrospinal fluid testing, in patients with suspected autoimmune encephalitis (AE), with focal hypometabolism, the most common PET/CT finding.³
- Spine MRI shows abnormalities in up to 45% of cases of paraneoplastic myeloneuropathy.⁴
- The three-dimensional (3D) constructive interference in steady state (CISS) is a gradient-echo MRI or Fast Imaging Employing Steady-state Acquisition Cycled Phases (FIESTA-C) on GE MRI systems are widely employed for over a decade and have been shown to have utility in demonstration of contrast between cerebrospinal fluid and brain parenchymal structure. Therefore, these have particular utility in the examination of cranial nerves, the ventricular system, cavernous sinus, and other structures which are commonly involved in neuro-inflammatory conditions.⁵
- Neuropsychiatric lupus and other neuro-inflammatory conditions have been described to mimic vascular disease, such as vasculitis and small vessel cerebrovascular disease, and in these cases vessel imaging with CT Angiography (CTA) and MR Angiography (MRA) Brain can contribute to meaningful diagnosis.⁶
- In the evaluation of a first episode of psychosis when an autoimmune cause is suspected, up to 4% of cases have abnormalities on MRI brain.⁷
- Sarcoidosis can manifest with neurologic complications in every part of the neural axis, with diagnostic challenges represented by multiple pathophysiologic pathways and frequently lack of specific histopathologic diagnosis. In clinically suspected neurosarcoidosis on the basis of synthesized clinical history and physical examination findings, the demonstration of neuro-inflammation using cerebrospinal fluid testing and contrast-enhanced MRI is useful. In difficult or complicated cases, FDG-PET and Gallium-67 imaging have been useful for identification of targets for biopsy.⁸

References

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