Acute encephalopathy as a presenting sign of suspected lupus cerebritis

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INTRODUCTION

Systemic lupus erythematous (SLE) is a chronic autoimmune condition that can affect any organ system, and may involve the nervous system; and can present with a number of different neurologic and psychiatric syndromes [Heller]. Central nervous system neuropsychiatric lupus refers to the various psychiatric and neurologic manifestations that develop secondary to involvement of the CNS in patients with SLE [Heller]. The term lupus cerebritis refers to the neuropsychiatric manifestations of lupus that appear to have an organic, rather than psychiatric basis, rather than a pathophysiologic mechanism [Heller]. For most phenotypic manifestations of neuropsychiatric SLE, no biomarkers or diagnostic tests are specific enough to attribute neurologic diagnosis to SLE, thus diagnosis of neuropsychiatric SLE nearly always requires rigorous exclusion of other causes [Gelfand].

HOSPITAL COURSE

The case we present is of a 38 year old African American female, who had no significant medical history other than a remote history of head trauma with two associated seizures that had occurred over fifteen years prior to her hospitalization. The patient presented to the hospital with acute encephalopathy and possible seizure like activity that occurred prior to arrival.

The patient had a complicated hospital course. Upon initial presentation patient was noted to be febrile and tachycardic, a lumbar puncture was performed and CSF studies noted a lymphocytic predominant pleocytosis and a negative meningoencephalitis panel. Patient was loaded and started on Keppra given the concern for seizure like activity prior to hospital arrival, had multiple EEGs that were negative for any epileptiform activity and had imaging of her Neuro-axis which was essentially unremarkable. She also underwent a CTA head/neck which was unremarkable and was unfortunately unable to tolerate a four vessel angiogram to assess for findings consistent with vasculitis. The patient was also found to have a pleural effusion and underwent thoracentesis, in which fluid studies were consistent with an exudative effusion, patient also underwent extensive laboratory testing which was essentially unremarkable other than the fact that serological testing for lupus came back positive, rheumatology was consulted, and the decision to start the patient on steroids in addition to mycophenolate mofetil was made for the diagnosis of SLE, only after the course of steroids and being on an immunosuppressant agent, did the patient begin to respond and follow commands allowing for a successful extubation.

IMAGING

The patient underwent comprehensive multiorgan imaging evaluation given her constellation of symptoms. This included magnetic resonance imaging of the neuraxis. Brain MRI did not reveal evidence of ischemia, and contrast sequences were not revealing of underlying infection or mass lesion. Spinal MR imaging was unrevealing for mass lesions or inflammatory processes. She underwent serial electroncephalography (EEG) monitoring given that her initial presentation involved a witnessed seizure. Multiple EEGs were performed, demonstrating bihemispheric slowing without evidence of epileptiform discharges. These EEG findings are consistent with non-specific encephalopathy, which corresponded with the patient's initial clinical exam. As the patient's mentation slowly improved and she became alert and oriented, serial EEG monitoring was no longer indicated and thus further studies were not performed.
CT angiogram of the head was performed to evaluate for vasculitis given the concern for autoimmune disease. This study revealed patent vasculature throughout both cerebral hemispheres and in the posterior circulation. There was no evidence of vascular malformation, including aneurysms, fistulas, dissections or stenosis. Part of the patient's routine evaluation entailed a trans thoracic echocardiogram (TTE), which incidentally revealed a large pericardial effusion. She underwent repeat TTE following intervention and treatment which confirmed resolution of the effusion.

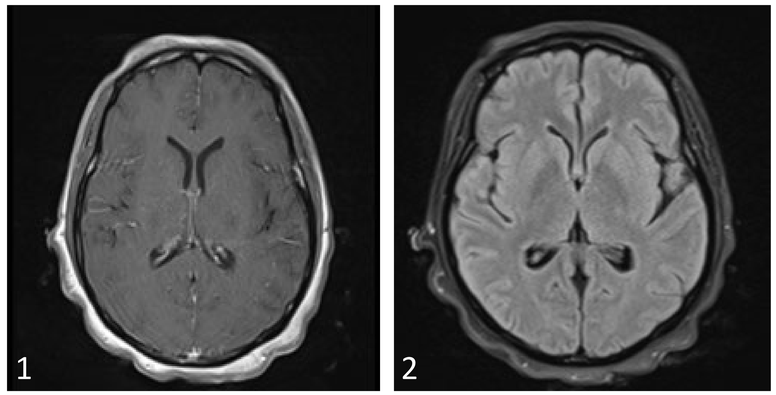

Fig 1 – Post-contrast MRI imaging did not reveal meningeal irritation to suggest underlying infection.

Fig 2 – Fluid attenuation inversion recovery sequence of MRI images demonstrates that brain parenchyma is preserved, with no evidence of microvascular ischemia.

DISCUSSION

Lupus cerebritis is an aggressive diagnostic entity that requires prompt and thorough evaluation, as it responds well to treatment. Diagnostic dilemmas are myriad in such cases, as the abundance of symptoms as well as multiorgan system involvement clouds the differential diagnosis. Neuropsychiatric symptoms of lupus cerebritis are not always present in patients who are newly diagnosed with SLE. Estimates are that between 28% and 40% of patients with a new diagnosis of SLE manifest neuropsychiatric symptoms.

The numerous neuropsyhiatric symptoms in SLE are often characterized on central nervous system (CNS) and peripheral nervous system (PNS) involvement. CNS symptoms include aseptic meningitis, cerebrovascular disease, cognitive dysfunction, headache, demyelinating syndromes, movement disorders, seizure disorders and transverse myelopathy. PNS symptoms include autonomic neuropathy, peripheral neuropathy, and sensorineural hearing loss. Mechanisms by which SLE provoke neuropsychiatric symptoms include autoantibody production, microangiopathy, production of proinflammatory cytokines, and atherosclerosis. The most common microscopic brain findings in the CNS are microvasculopathy. This case demonstrates some of the many neurological findings associated with lupus cerebritis provoked by untreated SLE. The inflammatory state triggers headache, and irritation of brain parenchyma ultimately provokes seizures. Cortical irritation breaks down the blood brain barrier and precipitates cognitive dysfunction, as cytokines infiltrate brain tissue.
Once the diagnosis is confirmed, treatment is effective and well tolerated. Symptomatic treatment is always warranted. As in our patient, antiseizure medications are often part of the treatment regimen. Steroids are the mainstay of SLE treatment, and coincidentally can also help with headache. As treatment progresses, encephalopathy and cognitive dysfunction improve with diminution of the inflammatory state. Most patients with SLE will eventually require chronic autoimmmune therapy, as our patient was placed on, and may be able to taper off symptomatic neurologic treatments, provided that they do not suffer permanent central nervous system damage.

PROGNOSIS

Patients presenting with acute central nervous system manifestations of SLE generally require treatment in an intensive care unit with neuroimaging capabilities. Treatment modalities generally vary in regards to the degree of severity of the acute attack, and a consulting Rheumatologist should be in cooperation. There is varied evidence on a logical therapeutic approach to the treatment of cerebral lupus due to the various pathogenesis. However, in general treatments consist of high dose IV corticosteroid regiments, antimalarials, cytotoxic agents such as cyclophosphamide, azathioprine, methotrexate or investigational pharmacological approaches such as Mycophenolate mofetil; which was used in our patient. Prognosis regarding CNS specific statistics are not available, however neurological complications generally worsen prognosis, in the setting of refractory seizures, encephalopathy, or paralysis from myelopathy or stroke. The overall outcome and quality of life for patients with CNS lupus manifestations can be enhanced with close follow up and coordination between the patient's Neurologist, Rheumatologist, and Primary Care Physician.

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