Stroke secondary to lupus vasculitis: Rehabilitation Challenges
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Abstract: BACKGROUND Rehabilitation of stroke secondary to lupus vasculitis is not so frequent challenge faced by physiatrists. The unrelenting course of SLE must also be addressed to augment the process of rehabilitation and help establish the desired goals.
OBJECTIVE 1. To discuss the challenges of rehabilitating a patient with stroke in the background of SLE complicated by cerebral nocardiosis. 2. To report a rare form of drug induced sensory ataxic neuropathy.

METHOD We report the challenges and outcome of rehabilitation of a patient previously diagnosed to have SLE, admitted from the outpatient stroke clinic with quadriparesis due to right internal capsule infarct and left cerebral nocardiosis.

The rehabilitation programme though complicated by several medical issues, resulted in improvement in the performance of activities of daily life and satisfactory ambulation.

CONCLUSION The need for meticulous and careful neurological examination and appropriate medical management of the systemic symptoms of SLE during the rehabilitation of patients with stroke due to lupus vasculitis is highlighted in this case report.

Keyword: Stroke rehabilitation, quadriplegia, SLE, Nocardiosis, Linezolid, hydrocephalus

INTRODUCTION Rehabilitation needs of patients with stroke are varied and complex depending on the neurological areas of involvement. (1) It becomes even more challenging if there is a background of an autoimmune disease complicated with cerebral infection. It warrants the addressing of neuromedical and neurosurgical issues, management of comorbidities along with the routine rehabilitation protocol and optimization of medications for the autoimmune disease. (2) In this report, we present the case of a 25 year old lady who was earlier diagnosed to have SLE. She presented to us with weakness of all four limbs, difficulty in speech and activities of daily living. The patient had bitemporal cortical insults of two different etiologies. While infarcts in the right hemisphere was the direct vasculitic/inflammatory effect of SLE, Nocardial abscess in the left cerebral hemisphere was probably due to the immunosuppression from the medications used for SLE.

This report describes the challenges in the rehabilitation of this patient requiring careful clinical monitoring of the neurological status, adequate immunosuppression for autoimmune disease, infection control with proper antibiotics, anticoagulation for the prevention of future CVAs and

CASE REPORT 30 year old lady was admitted for neurorehabilitation, with complaints of weakness of all four limbs, left more than right and slowness in speech for the past four months. She was apparently normal till 2011 when she started developing multiple joint pains with features of inflammatory arthritis. She was diagnosed to have SLE and was started on Tab.Mycofenolate and steroids from April 2014. She underwent surgery for cavernous hemangioma in the left frontal lobe in July 2014 and the immediate postoperative period was uneventful.

3 months later, she presented with history of fever, headache and altered sensorium for 2 months. Imaging revealed brain abscess and she underwent CT guided stereotactic aspiration of the pus from the left frontal abscess.

Fig 1. MRI brain dated 22/10/14 showing hyperintense lesion with peripheral hypointense enhancing rim in left frontal region and small ring enhancing lesions with T2 hypointense rim in adjacent brain parenchyma.

The culture grew Nocardia species for which she was started on double strength Cotrimoxazole and discharged with advice to continue the same for six months. There was mild residual weakness of the right upper and lower limbs. The following month, she had worsening sensorium with persisting fever, weakness of left upper and lower limbs and bladder and bowel incontinence. MRI brain showed resolving left frontal abscess and acute infarcts in the posterior limb of the internal capsule probably due to arteritis. She was started on antplatelet medication and a 2 week course of Inj.Amikacin and Imipenem along with Cotrimoxazole for the left frontal abscess. Following the acute medical management, the patient was referred for rehabilitation.
Another disturbing factor was abdominal upset and vomiting during therapy hours. Drug effect was suspected and Rheumatology opinion was sought for optimization of the immune suppressants.

Within a period of few days, her sensorium reduced and there was increasing drowsiness during and after the therapy hours. Neurological evaluation and workup for the same showed derangement of LFT (Liver Function Test) and fall in blood counts. Linezolid was replaced with Septan/Doxycycline in consultation with the Infectious Diseases unit. The dose of immunosuppressants was also reduced. LFT and Complete blood count profile in the subsequent weeks was found to be normal. One of the major obstacles for the progression of ambulation was sensory ataxic symptoms. Nerve conduction tests revealed sensory neuropathy. Linezolid induced sensory ataxic neuropathy was considered as a possibility. Improvement in the symptoms was noticed after several weeks of discontinuation of the medicine.

Dyselectrolemia was a problem throughout the rehabilitation. Electrolyte imbalance including hyponatremia causing drowsiness during therapy and hypokalemia needed attention and the careful correction of the same could bring better responses in therapy. Aerobic status and endurance to therapy was affected with tachypnoea and hypokalemia in oxygenation was brought about by blood transfusions and iron supplementation. She was also a known case of hypothyroidism which was monitored with Thyroid function evaluation and this was managed with Eltroxin supplementation. In parallel with the medical and neurosurgical management, a planned and titrated rehabilitation program was started. Muscular weakness, hand exercises and balance training activities were initiated. High sitting and standing balance improved with therapy. With progressive gait training, she was able to walk 25 meters in one stretch without any walking aid, with minimal one person support. Hand function training was given and she was able to perform simple tasks. Attention span and memory showed significant improvement. The final ACER scoring was 67/100, with individual scores of Attention-9/18; Memory-12/26; Fluency-7/14; Language-26/26; Visuospatial-13/16. She showed improvement in upper and lower half self dressing and achieved complete independence in feeding. She continued to need maximum support for toileting and bathing. Speech therapy was provided and Oromotor exercises and balance training activities were initiated. The clinical scenario was regularly updated to the therapists so that with careful planning and discussion the daily therapy session program was set. Regular feedback from the immediate care givers and therapists helped to analyse her clinical compliance with the rehabilitation program.

DISCUSSION

Systemic lupus erythematosus is a multiorgan autoimmune disease. SLE patients are at a 20% higher risk for stroke; 3–15% experience a nonfatal thrombotic stroke (3). Inflammatory vasculitis is caused by the deposition of immune complexes within the vessel wall. Cerebral vasculitis otherwise called PACNS (Primary angiitis of Central nervous system) is a rare disorder affecting both medium- and small-sized vessels. (4) Patients present with headache or even encephalopathy and stroke. A combination of plasmapheresis, and intravenous immunoglobulin treatment, along with high-dose steroids and cytotoxic drugs, are usually used in the treatment of severe SLE vasculitis. (5) The occurrence of Nocardial brain abscess in SLE has previously been reported. (6,7) Cerebellar haemorrhage in a patient with SLE who had Nocardial abscess has also been reported. (6) Quadriplegia in the patient presented in this case report on evaluation was found to be due to right internal capsular infarct and left cerebral residual Nocardial abscess. Meningeal and cerebral arterial irritation can occur when there is an associated abscess in the brain. The presence of cerebral abscess can result in the augmentation of vasculitic process.
with increased chances to get an ischemic or embolic vascular attack resulting in stroke. (8) A literature search did not show any reports of rehabilitation challenges and outcome of patients with stroke due to lupus vasculitis complicated with cerebral Nocardial abscess. This report aims to discuss the challenges of rehabilitating such a patient. Pope J et al has reviewed the frequency of adverse drug reactions in patients with systemic lupus erythematosus. (9) It is crucial to monitor these adverse effects in the rehab scenario. Another drug reaction mentioned in the previous studies relevant in this case is Linezolid induced toxicity. (10) Linezolid which was added in the anti Nocardial regime turned out to be the reason for sensory neuropathy during the rehab period. As co ordination and balance training is important for ambulation training, sensory neuropathy hindered the normal progress of therapy. Exclusion of other causes gave the clue regarding drug induced sensory neuropathy as stated in previous studies (10) and withdrawal of the drug resulted in gradual clinical improvement of that symptom. The rehabilitation programme included regular blood tests to assess the baseline parameters, neurological examination, sonographical investigation, imaging and optimization of medications, in addition to multidisciplinary therapy. Though there were several challenges during the rehabilitation programme, meticulous monitoring and management of medical/surgical complications brought significant improvement.

Conclusion
Rehabilitation of patients with stroke due to lupus can be challenging and complex. Immunosuppression for the autoimmune disease resulted in the development of cerebral abscess in the post operative period of cavernous hemangioma resection. Vasculitis secondary to SLE predisposed to CVA. Drug induced sensory ataxic neuropathy occurred with antibiotics used to treat Nocardiosis. Careful evaluation of each symptom with appropriate intervention along with the gradual progression of therapy resulted in clinical improvement. The medical reasoning and facts to be kept in mind along with the progress of usual stroke rehabilitation is highlighted in this case report.

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