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Case Report

Neuromyelitis Optica-Physiotherapy Management: Case Report

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Abstract

Background: *Neuromyelitis Optica which is abbreviated as NMO is an autoimmune disease of the central nervous system (CNS) affecting mainly the optic nerves and spinal cord. It is alternatively referred to as Neuromyelitis Optica spectrum disorder or NMOSD. With this rare disorder, the body's immune system mistakenly attacks healthy cells and proteins of the body most often those in the spinal cord and eyes. In NMO, abnormal autoantibodies bind to a protein called aquaporin-4, triggering parts of the immune system hence causing inflammation and damage to cells. This ultimately results in the loss of myelin structures of nerves in the brain and spinal cord.*

NMO affects regions of the central nervous system; spinal cord (longitudinally extensive transverse myelitis), optic nerve (optic neuritis), dorsal medulla, brainstem causing acute brainstem syndromes and thalamus/hypothalamus.[1] The attacks are commonly severe and most likely the minimum being in less than a week. Longitudinally extensive transverse myelitis (LETM) is the common specific presentation of NMO which is unusual in Multiple Sclerosis. LETM often results in paraplegia or tetraplegia depending on the spinal cord level involved. The sensory level is not rapidly involved which distinguishes NMO from Guillain–Barré syndrome. Intense itching due to inflammation of specific fibers in the spinothalamic tract and tonic spasms increased muscle tone during painful episodes.

Papp V et al (2021) in a systematic review concluded that NMO whose cause has not been clearly understood is a very rare disease worldwide, variations and prevalences have been described among diverse geographic areas and ethnicities. The adult population is more affected by NMO.[2] NMO appears to affect blacks than other ethnicities with female blacks more affected than their male counterparts[3] The population prevalence of neuromyelitis optica (NMO) is estimated to be between 0.3 and 4.4 per 100,000.[4] Neuromyelitis Optica has no cure but with appropriate management, various symptoms of the disease can be reversed and prevention of future attacks is possible.

Keywords: Case Report, Neuromyelitis Optica, Physiotherapy

1. Case Presentation

A 42-year-old woman developed nausea, vomiting and general body weakness. She was then quickly admitted in hospital emergency department and later to Intensive Care Unit (ICU) for respiratory support for her progressive respiratory failure and flaccid tetraplegia. No infections were reported preceding the event and generally her medical history was unremarkable. Among other investigations done, the brain and spinal cord Magnetic Resonance Imaging (MRI) revealed marked central nervous system lesions. Hospital management included respiratory support, immunosuppression therapies and steroids, chest physiotherapy and airway clearance. For 17days of ICU care, there was ultimately a considerable good prognosis, later she was transferred to the ward with minimal supplemental oxygen therapy. The muscles of upper and lower limbs had marked flaccidity, elsewhere sensation was well preserved and the chest was clear although there was reduced air entry for left and right lung lower lobes. Realistically, she was unable to perform (for herself) any of the (basic) activities of daily living (ADLs) which are; personal hygiene or grooming, dressing, toileting, transferring or ambulating and eating. She was discharged from the hospital on pain killers, steroids and immunosuppression therapy, and physiotherapy while two nursing staff members were assigned for her homecare.

2. Discussion

Physiotherapy focused on the management of clinical symptoms with the goals of achieving the lost skeletal muscle tone, having the client perform functions independently, get away with pressure sores and an improved quality of life. The client was enrolled for a 40 minutes daily home exercise program and after 14 weeks, she would ably and independently transfer herself from bed, stand and walk with a 4-point walking frame.

Initially, Tactile Stimulation demonstrated good results within the first 8days of intervention and the improvement was recorded for the right and left hip adductors as well as left elbow flexors with grade 1 to grade 2 of Medical Research Council (MRC) Scale for Muscle Strength. This technique was applied until all skeletal muscles involved in upper and lower limb functions achieved grade 3 of Medical Research Council (MRC) Scale for Muscle Strength. Chest physiotherapy

for the initial 3 weeks was also included in daily sessions of physiotherapy. Safe Proprioceptive neuromuscular facilitation techniques were also introduced on this particular case. Strengthening exercises with Thera-band and 1 to 2-kilogram dumbbell were also identified to benefit this case, Kegel's exercises were also suggested on this case under the supervision and guidance of a physiotherapist. Gross motor functions' re-education was introduced on bed and later on the rehabilitation mat whereas fine motor functions' re-education using a pen, pencil, book and other various small objects was as well considered. These demonstrated to be effective in the patient's functional life by seeing regain her full independence in both gross and motor functions. Physiotherapy significantly impacts in the recovery from neuromyelitis Optica events.

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