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IMPAIRMENT-BASED MULTIDISCIPLINARY REHABILITATION MANAGEMENT IN MULTIPLE SCLEROSIS IN PAKISTAN

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Multiple sclerosis (MS) is an autoimmune inflammatory demyelinating disease of the central nervous system causing chronic neurological disability in young and middle-aged adults worldwide.[1] It has a high prevalence in Europe, North America, and Australia (50–200/100,000 population).[2] There is no population-based study to determine the prevalence or incidence of MS in Pakistan. However, the documentation of patients with MS is growing, including the epidemiology, prevalent types of MS in the Pakistani population and their response to pharmacological treatment. With the launch of Pakistan Treatment in Multiple Sclerosis (PAKTRIMS), there is a futuristic plan to collect the data and enroll the patients with MS to see the burden of disease and specific characteristics of MS pertaining to our population.[3] Of note, despite tremendous improvement in pharmacological treatment, holistic care in MS is nearly impossible without adequate rehabilitation, which provides impairment-based management, hence improving quality of life. The rehabilitation services differ in their scope, quality and availability of trained rehabilitation professionals among developed countries and lower-middle-income countries (LMIC) like Pakistan.[4] As comprehensive multidisciplinary rehabilitation services in Pakistan are scarce and limited to few centers, the individualized rehabilitation units integrated with neurosciences departments are particularly lacking. Hence we felt a need to highlight the importance of rehabilitation in MS and its prospects in functional outcomes. Herein, we will highlight the common impairments seen in MS along with their rehabilitation management options available in Pakistan and underline the importance of a multidisciplinary treatment approach in MS.

MS is a complex condition with variable presentation and severity with unpredictable disease course, affecting almost every aspect of a patient's life. It requires comprehensive, long-term management, including pharmacology and multidisciplinary neurological rehabilitation.[5] There is evidence in literature that physical therapy improves functional outcomes (mobility, activities of daily living, muscle strength, general conditioning) and quality of life. A comprehensive multidisciplinary rehabilitation approach shows longer-term gains in reducing disability and improving participation.[6]

IMPAIRMENT-BASED ASSESSMENT AND MULTIDISCIPLINARY REHABILITATION

The impairments commonly seen in MS include pain, fatigue, bowel and bladder dysfunction, cognitive and emotional problems, sexual dysfunction, speech and swallowing disorders. The motor symptoms range from weakness, tremors, spasticity, and gait disturbance. Additionally, there can be visual problems, dizziness, vertigo, seizures, numbness and paresthesia.[7] Multidisciplinary in-patient rehabilitation includes a comprehensive assessment of the neuro-musculoskeletal system and functional impairments and the setting of realistic goals in collaboration with patients and caregivers. We'll discuss the following in detail

1. **Fatigue**
2. **Spasticity**
3. **Gait/Balance impairment**
4. **Pain**
5. **Bladder and bowel dysfunction**
6. **Sexual dysfunction**
7. **Cognitive and emotional problems**
8. **Social reintegration**

1. Fatigue

Fatigue is the most troublesome symptom for the patients and a major hurdle in performing daily activities. It can be MS-related or non-MS-related. MS-related fatigue may result from immune-pathological processes secondary to the release of cytokines, especially interleukins, which may be exacerbated by heat or stress (biological, physical and emotional).[7] Non-MS-related fatigue could be secondary to sleep disturbance, side effects of medicines, pain, spasticity, bladder dysfunction, anxiety and depression. Treatment of fatigue needs to be multidisciplinary; including medication (amantadine, modafinil, L-carnitine, methylphenidate, amino pyridines), appropriate graded exercise program (aerobic exercises, balance and resistive exercises), pacing activities, and behavioral modification therapy.[5,7]

2. Spasticity

Spasticity is one of the important causes of functional impairments in MS. It is noteworthy that every spasticity doesn't need to be treated, as it has a positive impact as well when a patient uses spastic/tone to stand up/transfer or walk to compensate for muscle weakness.[8] The negative impact includes reduced mobility, restricted range of motion, secondary malpositioning, contractures and pain. Hence the treatment of spasticity, whether pharmacological or non-pharmacological, needs to be weighed for risks and benefits after discussion with patients and caregivers. Identification of aggravating factors is important, which may include urinary tract infection, constipation, and pain. Pharmacological management may include oral (tizanidine, baclofen, gabapentin, dantrolene, diazepam and clonazepam) or intrathecal (baclofen) routes. Regional spasticity can be addressed by the use of botulinum toxin injections, chemical neurolysis of peripheral nerves (with phenol and alcohol), and orthotic supports. Physiotherapy and occupational therapy should always accompany pharmacological treatment.[7] There is a supportive role of physical modalities in reducing pain and response to active stretching during the course of physiotherapy. These modalities include cryotherapy, electrotherapy, and magnetic and laser therapy.[7] The cold laser decreases muscle tension and produces an analgesic effect. Physiotherapy options differ along the course of the disease; for instance, during acute illness, the aim is to prevent complications related to immobility. Hence a program of frequent changes of body position, passive exercises to prevent contractures and pressure ulcers, along with breathing exercises to prevent respiratory complications is implemented. Later on, stretching and relaxation exercises are continued along with strengthening of specific muscle groups.[9]

3.Gait/balance impairment

Balance and coordination impairments are commonly seen in MS patients, resulting in difficulty in mobility and gait. The incorporation of balance and coordination exercises may help in improving stability, preventing falls and enhancing posture control during gait with reduced energy consumption. Frenkel's coordination and balance exercises are carried out with footprints painted on the floor and gait training.[10]

Proprioception disorders are also common among MS patients, which may result in inadvertent injuries. Hence proprioceptive exercises are included in the early stages of rehabilitation.[7] Hippotherapy is an unconventional form of exercise using horse riding to improve balance, coordination and strength has shown to improve balance and stability in MS patients. There is an additional role of occupational therapy and the use of assistive gait aids ranging from ankle foot orthosis (AFO), canes, and walkers to powered wheelchairs.[9] All activities are planned with precaution to adjust the dose of exercise in an attempt to avoid overheating and fatigue.

4.Pain

The pain in MS can result from the demyelination process along pain-conducting pathways, with a typical example of trigeminal neuralgia, where the root entry zone of the trigeminal nerve is blocked due to demyelination.[11] Other forms of neuropathic pain can also be observed in these patients. Pain may be secondary to contractures, flexor spasms or urinary tract infections. The treatment of pain is according to the cause or location of the pain. WHO pain ladder approach along with anti-epileptics, can be used to treat pain.[12]

5.Bowel and bladder dysfunction

Bladder and bowel symptoms are incapacitating and socially embarrassing for patients, which cannot be controlled by medicines alone. Hence again, there is a specific role of multidisciplinary rehabilitation program. These symptoms are mostly seen in those MS patients who have spinal cord involvement. The most common symptom is urgency/frequency, and the most common

pattern of bladder dysfunction on urodynamic studies is detrusor hyperactivity with detrusor sphincter dyssynergia (DSD).[9]

The pharmacological management includes anticholinergic drugs resulting in decreased frequency and urgency with typical side effects of dry mouth and thirst. Physiotherapy in the form of pelvic floor training and bladder training protocols has shown improvement in the symptoms of frequency, urgency and incontinence.[13] The electrostimulation of the pudendal nerve also aids in the symptoms of detrusor hyperactivity.

In some cases, clean intermittent catheterization (CIC) with fluid restriction is indicated; if the patient is unable to do it due to advanced disability, then suprapubic catheterization is an alternative option, which carries a lower risk of infection and long term complications than indwelling catheters. In some selected cases, injection of botulinum toxin into the detrusor muscle is another option to reduce detrusor hyperactivity.[7]

Bowel abnormalities typically occur together with bladder dysfunction. Chronic constipation is the most common complaint resulting from spasticity of pelvis floor muscles, reduced gastro-colic reflex, inadequate hydration, immobility, medications' side effects and weak abdominal muscles.[14] The use of laxatives is recommended in these patients, along with additional measures, including dietary fiber intake and avoiding chocolate and drugs which cause constipation. Regular bowel programs are started by trained rehabilitation nurses, as in spinal cord injury.

6.Sexual dysfunction

Many patients with MS (approximately 73%) experience sexual dysfunction.[15] The dysfunction is multifactorial, mainly resulting from sensory disturbance and psychologic disorders like depression, further superimposed by spasticity, pain, alteration of body image, fatigue and certain medicines like tricyclics and selective serotonin reuptake inhibitors. The predominant complaints in female patients are anorgasmia/hyporgasmia, decreased vaginal lubrication, and reduced libido. In male patients, impotence or erectile dysfunction, ejaculatory dysfunction, orgasmic dysfunction, and reduced libido are common.[7]

Management of these symptoms again involves a multidisciplinary team involving the psychologist as an important team member. A thorough history is critical in the assessment of sexual dysfunction. The drug treatment is mainly limited to erectile dysfunction. The general management of all other impairments, already discussed, is extremely important for the overall better outcome of the patient.

7.Cognitive and emotional problems

Cognitive deficits can be seen earlier in the course of the disease, with increased risk of developing depression (in this population) in later stages. The common cognitive deficits include impairment of memory, attention and communication. Again, there is a role of multidisciplinary rehabilitation in identifying these deficits early and treating them promptly. There is some evidence that cognitive behavioral therapy, psychotherapy and group interventions may lead to enhanced motivation, improved social interaction and increased participation of patients.[16]

8. Social reintegration

Vocational rehabilitation and social reintegration are somehow neglected aspects of various disabling neurological disorders including MS care in developing countries. The social worker and occupational therapist, being part of a multidisciplinary rehabilitation team, evaluates social activity and participation, social circumstances, driving and access to transport, employment and needs of recreational rehabilitation.[7]

CONCLUSION

To summarize, we advocate active use of comprehensive in-patient and out-patient multidisciplinary rehabilitation for every patient of MS in order to identify the impairments and set tailor-made, achievable goals for each individual patient. There has been evidence that people with MS who were offered multidisciplinary rehabilitation showed improvement in activities of daily living, function and quality of life as compared to those who did not receive rehabilitation.[6] As the care and rehabilitation for MS patients is lifelong, we, therefore, recommend that a similar rehabilitation pathway should be devised for MS patients in Pakistan as proposed by Anwar F. et al for acquired brain injury patients.[4]

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