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Relapsing-Remitting Multiple Sclerosis in a Resource-Limited Setting: A Case Report from Ethiopia

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Case Report

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Abstract

Background

Multiple sclerosis (MS) is an immune-mediated, progressive demyelinating disease of the central nervous system (CNS). Although its prevalence is highest in temperate regions, cases are increasingly recognized in sub-Saharan Africa, including Ethiopia. This case report details the presentation, diagnosis, and comprehensive nursing management of a patient with relapsing-remitting MS (RRMS) in Hossana, Ethiopia, highlighting the unique challenges and opportunities for care in a low-prevalence, resource-limited setting.

Case Presentation:

A 32-year-old male administrative worker from Hossana, Ethiopia, presented with a six-month history of progressive fatigue, intermittent blurred vision, and episodes of numbness and weakness in his lower extremities. His clinical course was characterized by two distinct relapses followed by partial recoveries, consistent with RRMS. Neurological examination revealed bilateral optic disc pallor, diplopia on lateral gaze, lower extremity hyperreflexia, and a spastic gait. Magnetic resonance imaging (MRI) of the brain and spine demonstrated multiple periventricular and subcortical T2-hyperintense plaques consistent with demyelination. Cerebrospinal fluid (CSF) analysis showed oligoclonal bands not present in corresponding serum. A diagnosis of RRMS was confirmed according to the 2017 McDonald criteria.

Interventions:

Due to limited access to disease-modifying therapies (DMTs) in the region, initial management focused on treating the acute relapse with a short course of high-dose intravenous methylprednisolone (1 g daily for 5 days), which resulted in significant improvement in visual and motor symptoms. Symptom management was initiated: baclofen (5 mg orally three times daily, titrated to 15 mg three times daily) for spasticity, amantadine (100 mg twice daily) for fatigue, and a bowel/bladder regimen including oxybutynin for urgency and a bladder retraining program. A core component of the intervention was a nurse-led, individualized rehabilitation and education program based on the Neuman Systems Model. This included physical therapy for mobility and spasticity, occupational therapy for activities of daily living, and extensive patient/family education on energy conservation, fall prevention, and bladder management. The patient reported enhanced coping and quality of life, returning to work part-time with high life satisfaction, despite the absence of long-term DMTs.

Conclusion

This case underscores the emerging burden of MS in Ethiopia. It demonstrates that even in resource-limited settings with restricted access to advanced pharmacotherapies, a robust, nurse-led, multidisciplinary approach grounded in systematic assessment and individualized interventions can significantly improve patient outcomes, manage chronic symptoms, and empower patients and families to navigate the challenges of this complex disease.

Introduction

Multiple sclerosis (MS) is an immune-mediated, progressive demyelinating disease of the central nervous system (CNS), leading to impaired nerve impulse transmission and a wide array of neurological manifestations [1]. The pathogenesis involves sensitized T- and B-lymphocytes crossing the blood-brain barrier, triggering inflammation that destroys myelin and oligodendroglial cells [1].

Epidemiologically, MS shows a distinct north-south gradient, with higher prevalence in temperate regions [2]. However, the burden in sub-Saharan Africa is increasing, with an estimated 49,000 cases and a 6.1% rise in incidence between 2007 and 2017 [3, 4]. Ethiopia, with its low latitude (approximately 9°N), has historically been considered a low-prevalence region (estimated 1–5/100,000 people), with the first case reported 35 years ago [5]. This case report from Hossana, a town in southern Ethiopia, contributes to the growing body of literature on MS in the region and illustrates the pivotal role of nursing care when pharmacological options are limited.

This manuscript was prepared following the CARE guidelines (https://www.care-statement.org) [6].

Patient Information

A 32-year-old male administrative worker from Hossana, Ethiopia, was admitted to the adult health unit of the local teaching hospital with a chief complaint of progressive weakness in his legs and difficulty walking.

Primary Concerns and Symptoms

The patient reported that his symptoms began approximately six months prior to admission with persistent fatigue and a brief episode (lasting one week) of blurred vision in his right eye, which resolved spontaneously. Two months before admission, he experienced a subacute onset of numbness and "pins-and-needles" sensation ascending from his feet to his waist. One month before admission, he developed progressive weakness in both legs, unsteadiness when walking, and urinary urgency and frequency. He also reported double vision (diplopia) when looking to the left.

Medical, Family, and Psychosocial History

He had no prior history of autoimmune or neurological disease. His family history was negative for MS or other neurological disorders. He was a non-smoker, with a history of remote Epstein-Barr virus infection (mononucleosis) in his late teens. He was married and expressed anxiety regarding the impact of his

condition on his employment, financial stability, and marital relationship, including concerns about sexual function.

Timeline

The timeline and symptom progression are summarized in Table 1.

Table 1
Timeline of Symptoms

Date	Event
6 months prior to admission	Onset of persistent fatigue; brief episode (1 week) of blurred vision in right eye, resolving spontaneously
4 months prior to admission	Subacute onset of ascending numbness and paresthesia from feet to waist
3 months prior to admission	Progressive bilateral leg weakness, gait unsteadiness, urinary urgency and frequency; onset of diplopia on left lateral gaze
Admission	Hospital admission; comprehensive neurological assessment initiated
Day 1–5 of admission	Intravenous methylprednisolone (1 g daily); symptom management initiated
Day 4 of admission	Significant improvement in gait and visual symptoms
Weeks 1–2 post-discharge	Initiation of nurse-led rehabilitation program; physiotherapy, occupational therapy, patient/family education
3 months post-discharge	Follow-up assessment: ambulates with cane for 100 m; performs ADLs with assistance; reduced urgency episodes; works 4 hours/day; attending peer group; no falls; home modifications implemented
6 months post-discharge	Follow-up assessment: ambulates independently with cane; performs all ADLs independently; full continence with scheduled voiding; works 6 hours/day with pacing; remains fall-free; returned to work part-time; reports high life satisfaction

Clinical Findings

General Examination

The patient was alert and oriented to time, place, and person, with a visibly fatigued effect. Vital signs were within normal limits.

Cranial Nerves

Fundoscopic examination revealed bilateral optic disc pallor. Pupils were equal and reactive to light and accommodation. Left lateral gaze palsy with associated diplopia was observed.

Motor System

Upper extremities demonstrated normal tone and strength (5/5). Lower extremities showed increased tone (spasticity) graded 4/10 on the Modified Ashworth Scale, with power graded 4/5 proximally and 3/5 distally.

Sensory System

Impaired vibration sense and proprioception in the toes. Paresthesia to light touch from the mid-thigh distally bilaterally.

Coordination and Gait

Dysmetria on heel-to-shin testing bilaterally. Broad-based, spastic gait requiring a single-point cane for ambulation.

Reflexes

Hyperreflexia (3+) at patellar and Achilles tendons bilaterally. Bilateral Babinski sign present.

Diagnostic Assessment

Diagnostic Methods

The diagnostic workup included detailed neurological examination, brain and spinal cord MRI, and lumbar puncture with CSF analysis.

MRI (Brain and Spine)

Revealed multiple, ovoid, T2-hyperintense plaques in the periventricular and juxtacortical white matter, as well as two non-enhancing lesions in the cervical spinal cord, consistent with demyelination and fulfilling the criterion of "dissemination in space".

Cerebrospinal Fluid Analysis

Lumbar puncture showed normal opening pressure, mild lymphocytic pleocytosis (10 cells/μL), elevated IgG index, and the presence of unique oligoclonal bands (OCBs) in CSF that were absent in serum.

Diagnostic Challenges

The diagnosis of MS in this patient was complicated by the low prevalence of the disease in Ethiopia and the limited availability of advanced neuroimaging and CSF analysis in the region. The differential diagnosis included neuromyelitis optica spectrum disorder, acute disseminated encephalomyelitis, infectious etiologies (e.g., neurosyphilis, HIV-associated myelopathy), and nutritional deficiencies (e.g.,

vitamin B12 deficiency). These were systematically excluded based on clinical presentation, imaging characteristics, and laboratory findings.

Diagnosis

Based on the 2017 McDonald criteria, the patient was diagnosed with RRMS. Two separate clinical relapses (optic neuritis and the current sensorimotor relapse) and dissemination in space on MRI confirmed the diagnosis.

Prognosis

The prognosis for RRMS is variable. Without disease-modifying therapies, the patient is at risk for accumulating disability over time. However, with comprehensive symptom management and rehabilitation, functional outcomes can be optimized.

Therapeutic Intervention

Acute Relapse Management

Intravenous methylprednisolone (1 g daily for 5 days) was administered. This resulted in significant improvement in gait and visual symptoms by day 4 of treatment.

Symptom Management

Each symptom manifested in the patient was managed according to the details in Table 2.

Table 2
Management Mechanism Used for the Symptoms

Symptom	Intervention	Dosage/Details
Spasticity	Baclofen	5 mg orally three times daily, titrated to 15 mg three times daily
Fatigue	Amantadine	100 mg orally twice daily
Bladder dysfunction (urgency)	Oxybutynin	Standard dosing per hospital protocol
Bladder dysfunction	Bladder retraining program	Scheduled voiding, pelvic floor exercises
Bowel dysfunction	Bowel program	High-fiber diet, hydration, timed evacuation, stool softeners

Changes in Therapeutic Intervention

The baclofen dose was titrated from 5 mg orally three times daily to 15 mg three times daily over a two-week period (Weeks 1–2 post-discharge). The rationale for this escalation was the persistence of clinically significant spasticity (Modified Ashworth Scale grade 3) at the initial dose, which limited the patient's ability to participate in gait training. The dose was increased in 5 mg increments every 3–4 days, with monitoring for sedation and muscle weakness. At 15 mg three times daily, spasticity decreased to grade 1–2, enabling effective physiotherapy and independent ambulation with a cane. No dose adjustment was required for amantadine or oxybutynin, as the patient reported satisfactory fatigue and bladder control at initial doses.

Nursing and Rehabilitation Interventions (Based on the Neuman Systems Model) []

A primary nurse coordinated the patient's care, focusing on three levels of intervention to strengthen his lines of defense.

Nursing Diagnoses

1. Impaired physical mobility related to lower extremity weakness and spasticity
2. Impaired urinary elimination (urgency, frequency) related to CNS dysfunction
3. Fatigue related to disease process
4. Risk for injury related to sensory and visual impairment (diplopia, impaired proprioception)
5. Disturbed body image and sexual dysfunction related to disability and fatigue

Interventions

1. **Promoting Physical Mobility**: A physiotherapy protocol included range-of-motion exercises, stretching for spasticity, and progressive resistance training. The nurse taught energy conservation techniques (pacing, prioritizing tasks) and scheduled rest periods.
2. **Minimizing Spasticity and Contractures**: Proper positioning in bed, use of ankle-foot orthoses (AFOs), and education on avoiding noxious stimuli (tight clothing, pressure sores) that trigger spasms.
3. **Bladder and Bowel Management**: An intermittent self-catheterization schedule was discussed. A bowel program (high-fiber diet, hydration, timed evacuation, stool softeners) was initiated to manage constipation.
4. **Preventing Injury**: Home environment assessment led to recommendations for removing rugs, improving lighting, and installing grab bars. Education for the family on safe transfer techniques and fall prevention was provided.
5. **Psychosocial Support and Education**: A nurse-led peer group was established for the patient and two other young adults with chronic neurological conditions. This provided a forum for sharing concerns, receiving evidence-based knowledge, and reducing social isolation [8]. The nurse also

facilitated a private conversation with the patient and his wife to discuss coping strategies and address concerns about sexual dysfunction.

Follow-up and Outcomes

The clinical and patient-assessed outcomes are summarized in Table 3.

Table 3
Clinician- and Patient-Assessed Outcomes

Goal	Outcome at 3 Months	Outcome at 6 Months
Physical mobility	Ambulates with cane for 100 m; performs ADLs with assistance	**Met**: Ambulates independently with cane; performs all ADLs independently
Bladder continence	Episodes of urgency reduced; dry most days	**Met**: Full continence with scheduled voiding
Fatigue reduction	Reports ability to work 4 hours/day before severe fatigue	**Met**: Works 6 hours/day; manages fatigue with pacing
Injury prevention	No falls reported; home modifications implemented	**Met**: Remains fall-free
Coping/quality of life	Reports less anxiety; attending peer group regularly	**Met**: Returns to work part-time; reports high life satisfaction

Follow-up Diagnostic and Test Results

At the 3-month follow-up, a repeat brain MRI (without gadolinium contrast due to resource constraints) was performed. This showed stable lesion burden with no new T2-hyperintense plaques compared to the admission MRI, and no gadolinium-enhancing lesions were identified on the prior scan. The existing periventricular and juxtacortical white matter lesions remained unchanged in size and morphology. Two non-enhancing cervical spinal cord lesions were also stable. These findings were consistent with disease stability in the remission phase following acute relapse treatment and fulfilled the criterion for "no evidence of disease activity" (NEDA-2) on imaging.

At the 6-month follow-up, clinical examination revealed sustained neurological improvement: Modified Ashworth Scale score reduced to grade 1–2 (from grade 4 at admission), lower extremity power improved to 4+/5 proximally and 4/5 distally (from 4/5 and 3/5 respectively), and proprioception in the toes showed partial recovery. A repeat brain MRI was not performed at 6 months due to financial constraints and the absence of new clinical symptoms suggestive of relapse. Routine laboratory monitoring (complete blood count, renal function tests) performed at 3 and 6 months showed no abnormalities attributable to baclofen, amantadine, or oxybutynin therapy.

Intervention Adherence and Tolerability

The patient demonstrated excellent adherence to the medication regimen and rehabilitation program. No adverse effects from methylprednisolone, baclofen, amantadine, or oxybutynin were reported. The patient tolerated the physiotherapy and occupational therapy protocols without complications.

Adverse and Unanticipated Events

No adverse or unanticipated events were reported during the six-month follow-up period.

Patient Perspective

"When I first started having these symptoms, I was very scared. I thought I might lose my job and not be able to support my family. The nurses and therapists helped me understand my condition and taught me how to manage my daily activities. The peer group was especially helpful—I realized I was not alone. Now, I can walk with my cane, I am back at work part-time, and I feel more confident about my future. My wife and I have also learned to communicate better about my condition. I am grateful for the care I received, even though we did not have all the medicines available in other countries."

Discussion

This case of a 32-year-old male from Hossana highlights several critical issues in global MS care. First, it confirms that MS, while historically considered rare in Ethiopia, is present and likely underdiagnosed, consistent with a 19.5% increase in MS prevalence reported globally over the last five years [3]. His peak age of onset (early 30s) aligns with global patterns [9]. The male predominance in this single case does not reflect the well-established female predominance (approximately 3:1) in MS [9].

Second, the case exemplifies the classic RRMS course, present in approximately 85% of patients, where relapses are followed by partial recovery [1]. His clinical manifestations—fatigue, weakness, visual disturbances (diplopia, scotoma), and spasticity—reflect the multifocal demyelination of the optic nerves, cerebrum, brainstem, and spinal cord [1].

Third, and most importantly, this case demonstrates a best-practice nursing model for resource-limited settings. While disease-modifying therapies (interferons, glatiramer acetate, fingolimod) are the standard of care to reduce relapse frequency in RRMS, they are often unavailable or unaffordable in Ethiopia. In their absence, the nursing interventions became the cornerstone of management. As highlighted in the literature, continuity in nursing care contributes to a trusting relationship, enabling nurses to understand patient needs and facilitate daily rehabilitation [8]. The application of the Neuman Systems Model allowed for a structured, holistic assessment and intervention at multiple levels [7]. Furthermore, the nurse-led peer group addressed the critical need to share concerns and receive evidence-based knowledge, a proven strategy for improving quality of life [10]. The significant improvement in the patient's functional status and quality of life underscores that optimized nursing care is not merely supportive but can be transformative [11, 12].

Strengths and Limitations

Strengths

This case report provides a detailed, structured account of MS management in a resource-limited setting, following the CARE guidelines. The comprehensive documentation of nursing interventions and outcomes demonstrates the feasibility and effectiveness of a nurse-led, multidisciplinary approach when DMTs are unavailable. The inclusion of a patient perspective adds valuable context.

Limitations

This is a single-case report, which limits generalizability. The absence of long-term follow-up beyond six months precludes assessment of disease progression and sustained outcomes. The lack of access to DMTs, while reflective of the local reality, represents a significant deviation from standard of care and may have influenced the natural history of the disease. Additionally, formal cognitive screening was not performed, which is recommended in comprehensive MS care. The patient did not undergo formal neuropsychological assessment, and cognitive outcomes were not evaluated.

Conclusion

This case provides a powerful example of effective MS management in a low-prevalence, resource-limited setting like Hossana, Ethiopia. It shows that even without access to advanced disease-modifying therapies, a systematic, nurse-led approach grounded in thorough assessment, symptom management, patient education, and psychosocial support can achieve remarkable outcomes. For nurses in Ethiopia and similar contexts, this case reinforces their unique ability to establish, maintain, and sustain care for individuals with MS throughout the disease trajectory. As access to new therapies gradually expands, the foundational role of skilled nursing will remain essential to fighting the effects of this challenging and complex disease. Continuous education and training programs for nurses and patients alike are strongly recommended to further improve MS care everywhere.

Declarations

Informed Consent

Written informed consent was obtained from the patient for publication of this case report and disclosure of his clinical information. He was informed that his identity would be fully anonymized. No names, specific locations, or identifiable dates would be published. He could withdraw consent at any time. All patient identifiers have been removed or altered to protect confidentiality. This follows the CARE Guidelines and institutional ethical standards. The patient reviewed the content and approved its publication.

Ethics Approval

Ethical approval for this case report was obtained from the Institutional Review Board (IRB) of the Medical Ethical and Research Ethics Evaluation Committee, College of Medicine and Health Sciences,

Wachemo University, Hossana, Ethiopia (Reference No. CMHS/IRB/2929/2026). The study was conducted in accordance with the ethical principles of the Declaration of Helsinki and the research ethics guidelines of Wachemo University. Written informed consent for participation and publication of the case details was obtained from the patient prior to manuscript submission.

Consent for Publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying information. A copy of the written consent is available for review by the Editor of this journal upon request from the author.

Competing Interests:

The author declares no competing interests.

Clinical Trial Number

Not applicable.

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Authors' Contributions:

BGA conceived the case report, conducted the nursing assessment and interventions and wrote the manuscript. The author read and approved the final manuscript.

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Availability of Data and Materials

The datasets of history taking and physical examination during the current case report are available from the corresponding author on reasonable request.

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