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# Motor Neuron Disease (Amyotrophic Lateral Sclerosis) in a Middle Adult Filipino Patient in the Intensive Care Unit: A Case Report

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**Abstract: This case report describes the nursing care of a 48-year-old male Filipino patient admitted to the intensive care unit with Motor Neuron Disease (MND), specifically Amyotrophic Lateral Sclerosis (ALS). The patient presented with progressive muscle weakness, difficulty swallowing, and respiratory insufficiency. Diagnostic workup, including MRI and electrophysiological studies, confirmed the diagnosis. The patient was managed with mechanical ventilation, nutritional support, and symptomatic care. This case highlights the importance of multidisciplinary care in managing the complex needs of patients with MND.**

**Keywords:** *Motor Neuron Disease, Amyotrophic Lateral Sclerosis, case report, nursing care, intensive care unit*.

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## I. INTRODUCTION

Motor Neuron Disease (MND) is a progressive group of neurological disorders that affect motor neurons, leading to muscle weakness, atrophy, and paralysis. The most common type of MND is Amyotrophic Lateral Sclerosis (ALS). MND/ALS is characterized by the degeneration of motor neurons in the brain and spinal cord, resulting in the progressive loss of voluntary muscle control.[1] The incidence of MND/ALS is reported to be between 1.5 to 2.5 per 100,000 people per year, with a prevalence of approximately 3 to 5 per 100,000.[2] Patients with MND typically face a prognosis of three to five years, but survival can vary widely. This case report describes the nursing care of a middle adult Filipino patient with MND, focusing on the challenges of managing the progressive neurological decline and the interventions aimed at supporting his quality of life.

### *A. Patient Presentation*

A 48-year-old male from the Philippines was admitted to the intensive care unit with a diagnosis of MND, specifically Amyotrophic Lateral Sclerosis (ALS). He had been experiencing progressive muscle weakness for several months, initially in his lower extremities and later in his upper extremities. He also reported difficulty swallowing (dysphagia) and shortness of breath (dyspnea). The patient had no known comorbidities and denied any vices.

### *B. Assessment*

Upon admission, the patient was alert and oriented but exhibited significant muscle weakness and atrophy. A comprehensive assessment was conducted, focusing on the neurological, respiratory, cardiovascular, gastrointestinal, integumentary, and musculoskeletal systems.

Neurological assessment revealed that the patient initially exhibited slurred speech (dysarthria), generalized muscle weakness, and fasciculations, which are characteristic signs of MND. The patient's Glasgow Coma Scale (GCS) was 10 with spontaneous eye response, non-testable verbal response due to intubation, and was able to obey commands.

Respiratory assessment noted that the patient had a tracheostomy tube in place and was connected to a mechanical ventilator on assist-control mode for more than one week, signifying respiratory insufficiency. His respiratory rate was 24 breaths per minute, and oxygen saturation was 97%. Decreased breath sounds were noted in the lower lung fields, which could indicate a risk of pneumonia or atelectasis.

On cardiovascular assessment, the patient's blood pressure ranged from 100-110/80-90 mmHg, and his heart rate was 90 beats per minute, regular and strong. On the other hand, gastrointestinal assessment noted a nasogastric tube was in place for feeding, indicating that the patient was unable to meet his nutritional needs orally due to swallowing difficulties.

Integumentary assessment noted the patient's skin was fair, warm, and dry, with no observed lesions or edema, except for bilateral upper extremity edema. Musculoskeletal assessment showed muscle wasting was evident, particularly in the extremities. Bilateral upper extremity edema was present.

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Diagnostic tests revealed that the MRI showed an L3-L4 disc bulge, which may or may not be related to the patient's MND but could contribute to his overall discomfort or mobility issues. Electrophysiological studies (nerve conduction study and electromyography) showed findings that were consistent with denervation and reinnervation, supporting the diagnosis of MND. These tests assess the electrical activity of nerves and muscles and can help identify the characteristic patterns of motor neuron loss seen in MND.[1]

Laboratory results showed an elevated erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP), which are markers of inflammation; increased creatinine and alanine aminotransferase (ALT), which could indicate kidney or liver involvement; and a decreased serum potassium level (hypokalemia), which can have implications for muscle function and cardiac rhythm.

*C. Nursing Diagnoses* [3,4]

Based on the assessment findings, the following nursing diagnoses were identified:

- *Impaired gas exchange and Risk for dysfunctional ventilatory weaning response:*

The patient's respiratory muscle weakness, a direct consequence of MND, necessitated mechanical ventilation via a tracheostomy tube. This intervention, while life-sustaining, predisposes the patient to risks such as ventilator-associated pneumonia (VAP) and other respiratory complications.

- *Impaired physical mobility, Self-care deficit, and Risk for disuse syndrome:*

The progressive muscle weakness characteristic of MND significantly limited the patient's ability to perform activities of daily living (ADLs), including feeding, dressing, and toileting. This dependence on others for basic needs can have profound physical and psychological effects. Prolonged immobility also put him at risk of disuse syndrome, leading to muscle wasting or atrophy.

- *Impaired verbal communication:*

MND-related muscle weakness affected the patient's speech, leading to dysarthria. The presence of a tracheostomy tube further complicated verbal communication.

- *Activity intolerance:*

The patient experienced generalized muscle weakness, resulting in a limited ability to participate in physical activities and a decreased overall level of activity.

- *Risk for electrolyte imbalance:*

Factors such as dysphagia (difficulty swallowing), the use of a nasogastric tube for feeding, and potential kidney or liver involvement (as suggested by laboratory results) placed the patient at risk for electrolyte imbalances. Hypokalemia, in particular, can have serious consequences for muscle and heart function.

- *Anxiety:*

The patient's awareness of the progressive and ultimately fatal nature of MND, along with the increasing physical limitations, can lead to significant anxiety, fear, and emotional distress.

- *Plan of Care and Interventions*

The nursing care plan focused on supporting respiratory function, maintaining nutritional status, preventing complications of immobility, facilitating communication, and providing emotional support. A multidisciplinary approach, involving collaboration with physicians, nurses, respiratory therapists, physical therapists, occupational therapists, speech-language pathologists, and social workers, is crucial in the management of MND.[5]

- *Respiratory Management:*

The patient's respiratory status was closely monitored, including ventilator settings, oxygen saturation, and breath sounds. Given the patient's dependence on mechanical ventilation, meticulous attention was given to preventing ventilator-associated pneumonia (VAP). This involved the implementation of a VAP bundle, a set of evidence-based practices that may include: [6,7]

- Elevation of the head of the bed to at least 30 degrees
- Daily sedation vacation and assessment of readiness to extubate
- Subglottic secretion drainage
- Regular oral care with chlorhexidine
- Early mobilization, if possible

Suctioning was performed as needed to maintain airway patency and prevent the accumulation of secretions, which can increase the risk of infection.[8]

- *Nutritional Support:*

Enteral nutrition was provided via the nasogastric tube to ensure adequate caloric intake and prevent malnutrition. The patient received a specialized feeding formula at a rate of 300 milliliters every four hours. The nurse monitored fluid and electrolyte balance closely, paying particular attention to the patient's serum potassium level. Imbalances were corrected as needed, in collaboration with the physician and dietitian.

- *Mobility and Skin Care:*

To prevent the complications of immobility, such as muscle atrophy, contractures, and pressure ulcers, several interventions were implemented. Passive range of motion (PROM) exercises were performed every four hours to maintain joint mobility. The patient's skin was assessed regularly for any signs of breakdown, and pressure ulcer prevention measures, such as scheduled repositioning (every two to four hours), the use of pressure-relieving devices (e.g., specialized mattresses), and meticulous skin care, were implemented.

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➢ *Communication Support:*

Recognizing the patient's difficulty with verbal communication due to dysarthria and the presence of a tracheostomy tube, alternative communication strategies were employed. A white illustration board and marker were provided to facilitate written communication. The nurse used clear and simple language, allowed the patient ample time to express himself, and employed nonverbal cues such as facial expressions and gestures. Collaboration with a speech-language pathologist is essential to assess the patient's communication abilities and develop an individualized communication plan.[9,10]

➢ *Psychosocial and Emotional Support:*

The psychological and emotional impact of MND on the patient and his family cannot be overstated. The nurse addressed the patient's emotional and psychosocial needs through therapeutic communication, active listening, and emotional support. The nurse acknowledged the patient's feelings, provided a supportive presence, and offered reassurance and encouragement. The patient's spiritual beliefs and practices were also supported, recognizing the importance of spirituality in coping with a life-limiting illness. The involvement of a social worker or counselor can provide additional support and resources for the patient and family.

➢ *Evaluation*

The patient's condition remained critical, reflecting the progressive nature of MND. The interventions helped maintain respiratory function, provide nutritional support, and prevent complications. The patient was able to communicate his needs and express his feelings with the communication aids provided. However, ongoing evaluation and adjustments to the care plan were necessary to address the patient's changing needs and symptoms.

## II. DISCUSSION

This case highlights the complex and progressive nature of MND and the challenges of providing care for patients with this condition. MND presents a unique set of challenges due to its relentless progression and the involvement of multiple body systems.

The progressive degeneration of motor neurons in MND leads to a cascade of debilitating symptoms, including muscle weakness, atrophy, spasticity, and respiratory failure. These symptoms not only impair physical function but also significantly affect the patient's ability to communicate, swallow, and maintain independence.[5] As the disease progresses, patients often require increasing levels of care, placing a substantial burden on both themselves and their families.

Respiratory failure is a major cause of mortality in MND, with most patients eventually requiring ventilatory support.[1] The decision to initiate mechanical ventilation is a complex one, involving ethical considerations, quality of life issues, and the patient's wishes. Palliative care, including symptom management and psychosocial support, is crucial throughout the disease course to address the patient's physical, emotional, and spiritual needs.[11]

Effective communication is essential for patients with MND, yet it is often compromised by dysarthria and the need for tracheostomy. Alternative communication strategies, such as augmentative and alternative communication (AAC) devices, can help patients maintain their autonomy and participate in decision-making.[9,10] A multidisciplinary approach, involving speech-language pathologists, occupational therapists, and other specialists, is necessary to address these communication challenges.

Nutritional management is another critical aspect of care, as dysphagia can lead to malnutrition, dehydration, and aspiration pneumonia. Enteral feeding via a percutaneous endoscopic gastrostomy (PEG) tube may be necessary to maintain adequate caloric intake and prevent complications.[12] The timing of PEG tube placement is important, as earlier intervention may improve nutritional status and quality of life.

Nurses play a vital role in monitoring the patient's condition, implementing interventions to support physiological function, preventing complications, and providing emotional support to both the patient and his family. The importance of addressing not only the physical but also the emotional and spiritual needs of the patient is paramount in maintaining their quality of life. Palliative care should be integrated early in the disease trajectory to address symptoms, provide support, and assist with end-of-life planning.[11]

## III. CONCLUSION

This case report describes the nursing care of a 48-year-old Filipino male with MND. The patient's progressive neurological decline required intensive nursing care focused on respiratory support, nutritional management, and symptom control. Nurses are essential in the care of patients with MND, providing holistic care and support to improve their quality of life and that of their families.

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