



Hidden Weakness: Understanding Nerve Dysfunction in Critical Illness

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DESCRIPTION

Critical illness neuropathy is a serious complication that can develop in patients who require prolonged care in intensive settings, especially those supported by mechanical ventilation or affected by conditions such as sepsis or multi organ failure. This disorder primarily involves the peripheral nerves and results in muscle weakness, reduced reflexes and impaired movement. It often becomes noticeable when sedation is reduced or stopped and the patient fails to regain expected strength. This delay in recovery raises concerns about prolonged disability and extended dependence on supportive care. The condition is associated with metabolic imbalance, systemic inflammation and reduced blood flow to nerve tissues. During severe illness, the body experiences significant physiological stress that can disrupt normal nerve activity. Inflammatory mediators and altered microcirculation may damage nerve fibers, particularly in the limbs, leading to a symmetrical pattern of weakness that usually begins in the lower extremities and gradually progresses upward.

Identifying this condition can be challenging due to similarities with other neuromuscular disorders such as critical illness myopathy. Both conditions may present with generalized weakness and difficulty in reducing ventilatory support. Differentiation between nerve and muscle involvement is often achieved through electrophysiological assessments such as nerve conduction studies and electromyography. These methods help determine the extent and location of the impairment, guiding clinical management. Several risk factors increase the likelihood of developing this condition, including prolonged ventilation, high severity of illness, elevated blood glucose levels and the use of medications such as corticosteroids and neuromuscular blocking agents. Poor glycemic control is particularly significant, as increased glucose levels can disrupt nerve

metabolism and contribute to oxidative damage. Maintaining stable glucose levels is therefore considered an important preventive strategy in critically ill patients.

Clinical features vary depending on the degree of nerve involvement. Patients may develop flaccid paralysis, reduced or absent deep tendon reflexes and decreased sensitivity to touch or pain. In more severe cases, respiratory muscles may also be affected, which can complicate the process of discontinuing ventilatory support. This often leads to longer stays in intensive care and increases the risk of additional complications such as infections and pressure related injuries. Management focuses on supportive care and prevention of further nerve damage. Early mobilization is considered beneficial in preserving muscle strength and improving functional outcomes. Even passive movement exercises can help maintain joint flexibility and prevent contractures in patients who are unable to move on their own. As the patient's condition stabilizes, active rehabilitation becomes essential for restoring mobility and independence.

Nutritional support is another important component in recovery. Adequate intake of protein, vitamins and essential nutrients supports nerve repair and overall healing. Deficiencies in micronutrients, particularly vitamin B complex, may worsen nerve dysfunction, making balanced nutrition an important aspect of care. Collaboration between clinical teams and diet specialists ensures appropriate nutritional planning during the intensive care period. Reducing exposure to factors that may worsen nerve injury is also important. Careful use of sedatives, appropriate selection of medications and limiting unnecessary neuromuscular blocking agents can help lower the risk of neuropathy. Recovery can vary widely, with some patients showing gradual improvement over time while others experience lasting weakness. Rehabilitation programs that include physical and occupational therapy play

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a major role in improving functional ability. Psychological support is also necessary, as prolonged weakness and dependence can affect emotional well-being. A comprehensive approach that combines prevention, early recognition and coordinated care can reduce the impact of this condition and support better recovery outcomes.

Long term recovery from critical illness neuropathy often depends on the extent of nerve involvement and the overall health status of the patient before admission. Individuals who had pre-existing conditions such as diabetes or chronic illness may experience a slower and more limited recovery. Follow up care after discharge from intensive care is essential, as many patients continue to face weakness, fatigue and reduced mobility. Regular assessment in rehabilitation

settings helps track progress and identify areas that require additional support. Gradual improvement in muscle strength and coordination can be achieved through structured physical therapy programs that focus on endurance, balance and functional movements. Consistency in rehabilitation plays an important role in regaining independence and improving quality of life. Patients recovering from prolonged illness may face emotional challenges, including anxiety, frustration and reduced confidence in performing daily activities. Continued medical follow up ensures that any complications are addressed early and that progress is maintained over time. A coordinated effort between healthcare providers, patients and caregivers contributes to a more stable and sustained recovery.