Critical Illness Polyneuromyopathy: A Case Report

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Introduction

- Critical illness-associated weakness (CIAW) is a relatively common complication in the ICU, affecting up to 30-50% of critically ill patients and up to 70% of those with sepsis.
- Critical illness myopathy is characterized by more proximal, flaccid, symmetric muscle paralysis. Critical illness polyneuropathy is characterized by more distal, flaccid, symmetric paralysis with sensory deficits affecting the nerve axons.
- CIPNM is a subtype of CIAW that causes both proximal and distal symmetric weakness and sensory deficits, which can delay ventilator weaning and lead to prolonged disability.

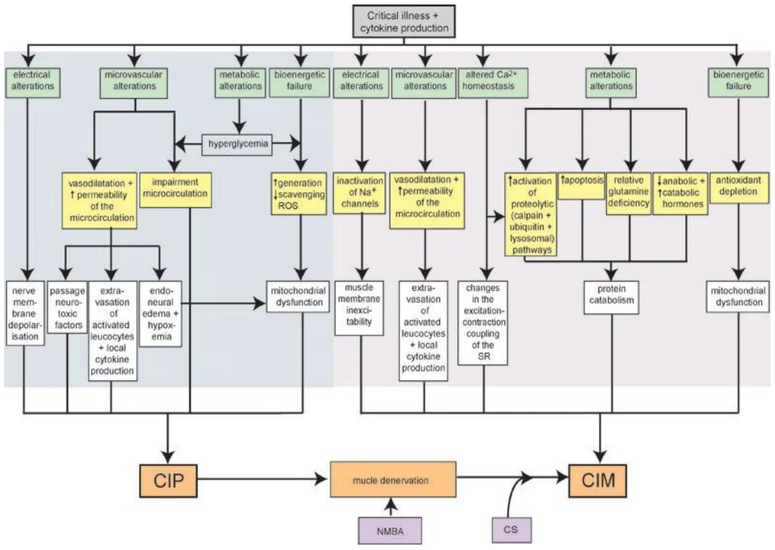

Figure 1: Pathophysiology of Critical Illness Polyneuromyopathy

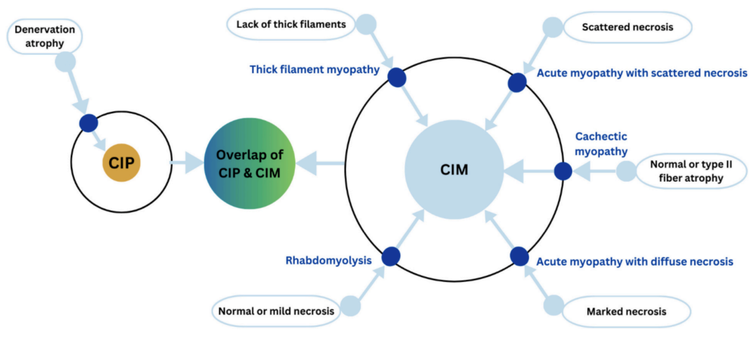

Figure 2: Critical Illness Polyneuropathy and Critical Illness Myopathy Overlap

Case

- A 24-year-old previously healthy male developed toxic megacolon and septic shock in the setting of disseminated aspergillosis, which led to a prolonged ICU stay.
- Septic shock secondary to toxic megacolon led to multiple surgeries, including colectomy, and ventilator support for one month.
- After extubation, he experienced severe pain and functional decline due to CIPNM and was referred to inpatient rehabilitation.
- He presented to acute rehab dependent for most tasks but was discharged with minimal assistance or full independence for all tasks and was ambulating with a rolling walker.

Critical illness polyneuromyopathy (CIPNM) is a common but often overlooked cause of weakness in ICU patients. Early recognition and rehabilitation can prevent long-term disability, even in young, healthy patients.

Diagnosis & Treatment

- Diagnosis is made when attempts to wean from ventilation are unsuccessful. Patients with CIP commonly show both axonal motor and sensory polyneuropathy on electromyography, with absent decremental response to repetitive stimuli.
- Patients with CIM typically show compound muscle action potential amplitudes below 80% of normal in at least two nerves, needle EMG with short-duration and low-amplitude motor unit potentials, and no decremental response to repetitive stimuli.
- However, obtaining these results is challenging in a critically ill patient with additional factors such as edema, decreased voluntary muscle contractions, and interference.
- Currently, there are no disease-specific treatments for CIPNM. Management is primarily supportive with an emphasis on early intervention to improve morbidity and long-term prognosis.
  Supportive strategies:
  - Early mobilization and physiotherapy (both active and passive ROM once the patient is hemodynamically stable)
  - Strict glycemic control to maintain euglycemia
  - Adequate nutritional support
  - Aggressive treatment of the underlying critical illness

Discussion & Conclusion

- CIPNM should be considered in patients with difficulty weaning from ventilation after critical illness, especially in the setting of sepsis or prolonged immobilization.
- Early neuromusculoskeletal evaluation and prompt mobilization are essential to decrease morbidity and improve long-term positive functional outcomes.
- CIPNM can occur even in young, healthy individuals, and early recognition is crucial to prevent long-term disability
- Early and intensive inpatient rehabilitation can significantly improve function and assist patients in regaining independence.

Resources