

RHABDOMYOLYSIS: LITERATURE REVIEW

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ABSTRACT

Rhabdomyolysis is a serious and potentially life-threatening condition characterized by the breakdown of skeletal muscle fibres, resulting in the release of intracellular contents, including myoglobin, into the bloodstream. This can lead to complications such as acute kidney injury (AKI), electrolyte imbalances, and systemic inflammation. The etiology of rhabdomyolysis is multifactorial, encompassing traumatic, non-traumatic, and exertional causes.

Keywords: muscle fibres, electrolyte imbalances, acute kidney injury.

Introduction

The word rhabdomyolysis is derived from the Greek words rhabdos (rod-like/striated), mus (muscle), and Lucis (breakdown). Rhabdomyolysis is a serious medical condition characterized by the breakdown of muscle tissue, leading to the release of intracellular components such as myoglobin into the bloodstream, potentially causing significant complications like kidney damage.

Etiology

Rhabdomyolysis can result from various causes, including:

Trauma or injury: Severe muscle damage from accidents, crush injuries, or prolonged immobilization.

Exertional factors: Intense physical activity, particularly in those who are not well-conditioned.

Medications and drugs: Use of statins, certain antipsychotics, alcohol, cocaine, and other illicit drugs.

Infections: Both viral and bacterial infections.

Genetic conditions: Inherited metabolic muscle diseases.

Toxins: Exposure to snake venom and excessive alcohol intake.

Clinical Manifestations

The clinical presentation of rhabdomyolysis can vary, commonly including:

Muscle pain, weakness, and swelling

Dark, cola-colored urine, indicative of myoglobinuria

Fatigue

Nausea and vomiting

Mental confusion or disorientation

Fever (occasionally)

Diagnostic Approach

The diagnosis of rhabdomyolysis involves:

Clinical evaluation: Assessing patient history and symptoms related to muscle injury or excessive exertion.

Laboratory tests: Elevated serum creatine kinase (CK), myoglobin, and potassium levels.

Urine analysis: Detection of myoglobin.

Imaging: MRI or CT scans to assess the extent of muscle damage.

Management

The management of rhabdomyolysis aims to treat the underlying cause, alleviate symptoms, and prevent complications:

Fluid therapy: Administration of intravenous fluids to maintain renal function and promote urine output.

Pharmacological interventions: Pain management and treatment of the underlying cause.

Renal support: Dialysis in cases of severe kidney impairment.

Electrolyte correction: Management of electrolyte imbalances, including potassium, calcium, and phosphate.

Monitoring: Continuous monitoring of renal function, electrolytes, and muscle enzyme levels.

Potential Complications

If untreated, rhabdomyolysis can lead to severe complications, such as:

Acute kidney injury

Electrolyte disturbances

Cardiac arrhythmias

Compartment syndrome

Disseminated intravascular coagulation (DIC)

Preventive Strategies

Preventive measures for rhabdomyolysis include:

Ensuring adequate hydration, especially during intense physical activities.

Gradual progression in exercise intensity.

Avoidance of known muscle-damaging drugs and toxins.

Monitoring and adjusting medications that may predispose individuals to rhabdomyolysis.

Nursing Management of Rhabdomyolysis

Nursing management of rhabdomyolysis focuses on early detection, prompt intervention, continuous monitoring, and patient education to prevent complications and promote recovery.

Initial Assessment and Diagnosis

Comprehensive Assessment:

Obtain a detailed patient history, including recent physical activities, trauma, medication use, and substance abuse.

Perform a thorough physical examination, noting signs of muscle pain, weakness, swelling, and urine discoloration.

Monitor laboratory values, particularly serum creatine kinase (CK), myoglobin, potassium, and renal function tests (BUN, creatinine).

Conduct urinalysis to check for myoglobinuria.

Initiate aggressive intravenous hydration to maintain renal perfusion and promote myoglobin excretion.

Monitor fluid intake and output closely to prevent fluid overload and ensure adequate urine output

Regularly check and correct electrolyte imbalances, especially hyperkalemia, hypocalcemia, and hyperphosphatemia.

Administer medications as prescribed to manage electrolyte levels.

Administer analgesics as prescribed to manage muscle pain and discomfort.

Monitor renal function tests regularly.

Prepare for potential dialysis if there is evidence of acute kidney injury.

Monitor vital signs frequently, including blood pressure, heart rate, respiratory rate, and temperature.

Be vigilant for signs of shock, arrhythmias, or other complications.

Measure urine output hourly to ensure it remains adequate.

Observe for changes in urine color and report dark or cola-colored urine promptly.

Regularly assess serum CK levels to monitor the extent of muscle breakdown.

Continuously monitor electrolyte levels and renal function.

Assess for signs of compartment syndrome, such as severe pain, swelling, and decreased peripheral pulses.

Notify the healthcare provider immediately if compartment syndrome is suspected.

Educate the patient on the importance of hydration and avoiding strenuous activities until fully recovered.

Inform the patient about the potential causes and triggers of rhabdomyolysis to prevent recurrence.

Ensure the patient understands the importance of adhering to prescribed medications, including any changes in statin or other drug therapies.

Educate on the signs and symptoms of potential drug interactions or side effects.

Advise gradual resumption of physical activities and proper warm-up exercises to prevent muscle injury.

Discuss the avoidance of substances that could contribute to muscle breakdown, such as certain drugs and alcohol.

Schedule follow-up appointments for ongoing monitoring of renal function and muscle enzyme levels.

Encourage the patient to report any new or recurring symptoms promptly.

CONCLUSION

Not every muscle trauma leads to rhabdomyolysis and renal failure. Alternative causes for acute renal failure, like dehydration, sepsis, and drugs, should always be evaluated. Rhabdomyolysis is a complex condition that requires prompt recognition and comprehensive management to prevent severe complications. Early diagnosis and aggressive treatment, particularly fluid resuscitation, are crucial for improving outcomes. Multidisciplinary care, including diligent nursing management, is essential for effective treatment and patient education. Further research into the prevention and optimal management of rhabdomyolysis, particularly non-traumatic causes, is needed to enhance patient care.

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