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RHABDOMYOLYSIS – DIAGNOSIS AND TREATMENT

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Rhabdomyolysis results from the rapid breakdown of skeletal muscle fibers, which leads to leakage of potentially toxic cellular content into the systemic circulation (Hamel et al., 2015, p. 621). Rhabdomyolysis is a syndrome that is characterized by muscle necrosis and the release of intracellular muscle constituents into circulation leading to complications and disease. Rhabdomyolysis symptoms range from minor body aches to life threatening disease and acute kidney injury. The clinical features of rhabdomyolysis include myalgia, muscle weakness, myoglobinuria and muscle swelling that develops over hours to days (Nance & Matten, 2015, p. 789).

Pathophysiological Processes

Rhabdomyolysis is a disease process that is not caused by a single event but is rather a complex process that involves multiple factors. The pathophysiology of rhabdomyolysis is multifaceted and involves a complex interplay of factors that contribute to the development of the syndrome. The pathophysiological processes involved in the development of rhabdomyolysis include:

1. **Clinical manifestations and complications of rhabdomyolysis result from muscle cell death, which may be triggered by a variety of initiating events** (Torres, Helimester, Kaye, & Kaye, 2015).
2. **Increased intracellular calcium leads to activation of proteases, increased skeletal muscle cell contractility, mitochondrial dysfunction, and the production of reactive oxygen species, resulting in skeletal muscle cell death**.
3. **ATP depletion leads to myocyte injury and the release of intracellular muscle constituents, including creatine kinase (CK) and other muscle enzymes, myoglobin, and various electrolytes**.
4. **The end result of these alterations within the muscle cell milieu is an inflammation, self-sustaining myolytic cascade that causes necrosis of the muscle fibers and releases the muscle contents into the extracellular space and the bloodstream** (Torres, Helimester, Kaye, & Kaye, 2015, p. 60).

Signs & Symptoms

- **Clinical manifestations** include:
  - Myalgia
  - Rhabdomyolysis myoglobinuria
  - Fatigue
  - Tachycardia
  - Nausea and vomiting
  - And abdominal pain (Miller, 2016)

- **Additional symptoms** that are more common in severely affected patients include:
  - Malaise
  - Fever
  - Tachycardia
  - Nausea and vomiting
  - And abdominal pain (Miller, 2016)

Significance of Pathophysiology

Rhabdomyolysis is a significant issue for clinicians, knowledge of the pathways of the disease helps a clinician understand what to expect and how to properly manage a patient. Pathophysiology of rhabdomyolysis allows the clinician to be proactive instead of reactive hence reducing complications from the syndrome. The clinician has to understand pathophysiology of rhabdomyolysis and the signs and symptoms of the disease to ensure timely diagnosis and treatment. Rhabdomyolysis can be life threatening and disabling, having a clinician who knows how the syndrome progresses is vital in ensuring proper patient outcomes.

- **While the patient benefits from a knowledgeable clinician, pathophysiology of rhabdomyolysis is also of critical significance to the patient. A person who is knowledgeable about the disease process and pathophysiology is able to determine the disease from occurring and has better outcomes when affected by such a disease. Patients who have an understanding of the pathophysiology of any disease are likely to be compliant to treatment regimen and are likely to engage in practices that prevent the disease. Understanding pathophysiology of rhabdomyolysis is important in the overall management of the disease and ensures successful reversal of symptoms.**

Implications for Nursing Care

- **Rhabdomyolysis requires early recognition of the syndrome and early intervention to prevent complications set in. Implications of nursing care involve providing ongoing nursing care. The treatment of rhabdomyolysis includes fluid replacement via intravenous therapy.**
- **Volume repletion with saline is essential to avoid hypovolemia; shock and acute kidney injury** (Nance & Pach, 2016, p. 2). Nursing care will include sequential monitoring of urine output or volume, color and specific gravity to guide continued fluid replacement and resuscitation. The nurse should be vigilant to ensure no major complications occur. Physical examinations and laboratory studies are indicated to monitor for compartment syndrome, hyperkalemia, acute oliguric or no oliguric renal failure, and disseminated intravascular coagulation (Muscal & DeDeusman, 2015).
- **The next key step is identification and correction of the inciting cause (e.g., trauma, exertion, or toxin) (Muscal & DeDeusman, 2015). Finding the causative agent and eliminating it will ensure the patient will recover without further complications. Trying to treat the problem without eliminating or correcting the inciting agent will prolong the process of healing or even worsen the patient’s condition. Correction of electrolyte, acid-base, and metabolic abnormalities will be achieved with no difficulty if the causative agent has been removed.**

Conclusion

Rhabdomyolysis is a major clinical challenge, it manifests itself in different nonspecific symptoms which makes it difficult to diagnosis hence easy to lead to systemic complications. The prognosis of rhabdomyolysis depends on the complications resulting from the syndrome and the underlying cause. When treated early and aggressively, an episode of rhabdomyolysis has an excellent prognosis (Zutt, Van der Kooi, Liethem, Varon, & De Visser, 2014, p. 637). Clinicians should be aware of the symptoms of the syndrome and be ready to intervene in a timely manner to prevent it. Rhabdomyolysis includes acute kidney injury, compartment syndrome, disseminated intravascular coagulation and hyperkalemia.

References


