Rhabdomyolysis – Understanding the Mechanics

Tawnya Tucker
Otterbein University, tawnya.tucker@otterbein.edu

Follow this and additional works at: https://digitalcommons.otterbein.edu/stu_msn

Part of the Digestive System Diseases Commons, Medical Pathology Commons, and the Nursing Commons

Recommended Citation
https://digitalcommons.otterbein.edu/stu_msn/128

This Project is brought to you for free and open access by the Student Research & Creative Work at Digital Commons @ Otterbein. It has been accepted for inclusion in Nursing Student Class Projects (Formerly MSN) by an authorized administrator of Digital Commons @ Otterbein. For more information, please contact digitalcommons07@otterbein.edu.
Introduction

As a hospital healthcare provider on a Medical/Surgical Unit the probability of encountering and treating a patient diagnosed with rhabdomyolysis is scarce. Knowing the mechanics of the disease will assist the provider in evaluating and treating the patient. Awareness of the pathophysiology of the disease is vital in accurately diagnosing and treating the disease. The role of the advanced practice nurse is fundamental in distinguishing possible causes of the phenomenon by recognizing signs and symptoms that occur with the disease. Completing a thorough physical exam on the patient and obtaining special lab tests will assist in identifying the ailments. Treating the patient appropriately will enhance the outcome and can prevent possible serious and long-term complications.

Understanding the mechanics of rhabdomyolysis will enhance awareness and understanding of the disease. Rhabdomyolysis is a result of skeletal muscle breakdown and subsequent release of intracellular contents that can lead to possible life-threatening complications (Shapiro & Luchette, 2012). Employed on a Medical/Surgical Unit two patients were diagnosed with rhabdomyolysis within a two-year period. Intraoperative questions, intravenous fluid resuscitation, and supportive continued analysis of the disease.

The Skeletal muscle breakdown in rhabdomyolysis leads to the depletion of adenine triphosphate (ATP). The loss of ATP energy causes the sodium/potassium pump and the sodium/calcium exchangers to become non-functional. The damage subsequently releases potassium, phosphates, creatine kinase (CK), lactate dehydrogenase, and aldolase into circulation (Terres, Helmsetter, Kaye, & Maye, 2015). Myoglobin released into the extracellular space and bloodstream is filtered out of the body by the kidneys leading to direct urine color myoglobinuria. Myoglobin is harmful to the kidney and can lead to acute kidney injury (Elsayed & Reilly, 2010).

Underlying Pathophysiology

Rhabdomyolysis is triggered by various factors including: Traumatic and indirect muscle damage - Medications, toxin, substance, herbal supplements Genetic, metabolic, and endocrinologic disorders - Infectious and inflammatory processes - Exercise and heat - Ischemia - Alcohol and drug abuse

Signs & Symptoms

The gold standard clinical manifestations of rhabdomyolysis include the triad of dark urine, muscle pain/weakness, and fatigue. Patients may complain of flank pain along with low back discomfort that may reflect secondary acute renal failure (Raghuram, 2012). Presentation of chest pain, shortness of breath and weakness of the left upper extremity warrants an EKG to determine cardiac dysrhythmias (Pincavage, Böld, Wolfe, & Lattosch, 2014).

Exploratory research on the topic provided detailed insight on the cause and symptoms. Care for the patients were greatly enhanced. Obtaining further knowledge of the pathophysiology, diagnosis, and treatment of the disease were identified.

The gold standard clinical manifestations of rhabdomyolysis include the triad of dark urine, muscle pain/weakness, and fatigue. Patients may complain of flank pain along with low back discomfort that may reflect secondary acute renal failure (Raghuram, 2012). Presentation of chest pain, shortness of breath and weakness of the left upper extremity warrants an EKG to determine cardiac dysrhythmias (Pincavage, Böld, Wolfe, & Lattosch, 2014).

Introduction

As a hospital healthcare provider on a Medical/Surgical Unit the probability of encountering and treating a patient diagnosed with rhabdomyolysis is scarce. Knowing the mechanics of the disease will assist the provider in evaluating and treating the patient. Awareness of the pathophysiology of the disease is vital in accurately diagnosing and treating the disease. The role of the advanced practice nurse is fundamental in distinguishing possible causes of the phenomenon by recognizing signs and symptoms that occur with the disease. Completing a thorough physical exam on the patient and obtaining special lab tests will assist in identifying the ailments. Treating the patient appropriately will enhance the outcome and can prevent possible serious and long-term complications.

Understanding the mechanics of rhabdomyolysis will enhance awareness and understanding of the disease. Rhabdomyolysis is a result of skeletal muscle breakdown and subsequent release of intracellular contents that can lead to possible life-threatening complications (Shapiro & Luchette, 2012). Employed on a Medical/Surgical Unit two patients were diagnosed with rhabdomyolysis within a two-year period. Intraoperative questions, intravenous fluid resuscitation, and supportive continued analysis of the disease.

The Skeletal muscle breakdown in rhabdomyolysis leads to the depletion of adenine triphosphate (ATP). The loss of ATP energy causes the sodium/potassium pump and the sodium/calcium exchangers to become non-functional. The damage subsequently releases potassium, phosphates, creatine kinase (CK), lactate dehydrogenase, and aldolase into circulation (Terres, Helmsetter, Kaye, & Maye, 2015). Myoglobin released into the extracellular space and bloodstream is filtered out of the body by the kidneys leading to direct urine color myoglobinuria. Myoglobin is harmful to the kidney and can lead to acute kidney injury (Elsayed & Reilly, 2010).

Underlying Pathophysiology

Rhabdomyolysis is triggered by various factors including: Traumatic and indirect muscle damage - Medications, toxin, substance, herbal supplements Genetic, metabolic, and endocrinologic disorders - Infectious and inflammatory processes - Exercise and heat - Ischemia - Alcohol and drug abuse

Signs & Symptoms

The gold standard clinical manifestations of rhabdomyolysis include the triad of dark urine, muscle pain/weakness, and fatigue. Patients may complain of flank pain along with low back discomfort that may reflect secondary acute renal failure (Raghuram, 2012). Presentation of chest pain, shortness of breath and weakness of the left upper extremity warrants an EKG to determine cardiac dysrhythmias (Pincavage, Böld, Wolfe, & Lattosch, 2014).

Exploratory research on the topic provided detailed insight on the cause and symptoms. Care for the patients were greatly enhanced. Obtaining further knowledge of the pathophysiology, diagnosis, and treatment of the disease were identified.

The gold standard clinical manifestations of rhabdomyolysis include the triad of dark urine, muscle pain/weakness, and fatigue. Patients may complain of flank pain along with low back discomfort that may reflect secondary acute renal failure (Raghuram, 2012). Presentation of chest pain, shortness of breath and weakness of the left upper extremity warrants an EKG to determine cardiac dysrhythmias (Pincavage, Böld, Wolfe, & Lattosch, 2014).

Introduction

As a hospital healthcare provider on a Medical/Surgical Unit the probability of encountering and treating a patient diagnosed with rhabdomyolysis is scarce. Knowing the mechanics of the disease will assist the provider in evaluating and treating the patient. Awareness of the pathophysiology of the disease is vital in accurately diagnosing and treating the disease. The role of the advanced practice nurse is fundamental in distinguishing possible causes of the phenomenon by recognizing signs and symptoms that occur with the disease. Completing a thorough physical exam on the patient and obtaining special lab tests will assist in identifying the ailments. Treating the patient appropriately will enhance the outcome and can prevent possible serious and long-term complications.

Understanding the mechanics of rhabdomyolysis will enhance awareness and understanding of the disease. Rhabdomyolysis is a result of skeletal muscle breakdown and subsequent release of intracellular contents that can lead to possible life-threatening complications (Shapiro & Luchette, 2012). Employed on a Medical/Surgical Unit two patients were diagnosed with rhabdomyolysis within a two-year period. Intraoperative questions, intravenous fluid resuscitation, and supportive continued analysis of the disease.

The Skeletal muscle breakdown in rhabdomyolysis leads to the depletion of adenine triphosphate (ATP). The loss of ATP energy causes the sodium/potassium pump and the sodium/calcium exchangers to become non-functional. The damage subsequently releases potassium, phosphates, creatine kinase (CK), lactate dehydrogenase, and aldolase into circulation (Terres, Helmsetter, Kaye, & Maye, 2015). Myoglobin released into the extracellular space and bloodstream is filtered out of the body by the kidneys leading to direct urine color myoglobinuria. Myoglobin is harmful to the kidney and can lead to acute kidney injury (Elsayed & Reilly, 2010).

Underlying Pathophysiology

Rhabdomyolysis is triggered by various factors including: Traumatic and indirect muscle damage - Medications, toxin, substance, herbal supplements Genetic, metabolic, and endocrinologic disorders - Infectious and inflammatory processes - Exercise and heat - Ischemia - Alcohol and drug abuse

Signs & Symptoms

The gold standard clinical manifestations of rhabdomyolysis include the triad of dark urine, muscle pain/weakness, and fatigue. Patients may complain of flank pain along with low back discomfort that may reflect secondary acute renal failure (Raghuram, 2012). Presentation of chest pain, shortness of breath and weakness of the left upper extremity warrants an EKG to determine cardiac dysrhythmias (Pincavage, Böld, Wolfe, & Lattosch, 2014).

Exploratory research on the topic provided detailed insight on the cause and symptoms. Care for the patients were greatly enhanced. Obtaining further knowledge of the pathophysiology, diagnosis, and treatment of the disease were identified.