Rhabdomyolysis Diagnosis in Division III College Football Player
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Background: Rhabdomyolysis can be a fatal condition characterized by the breakdown of muscle fibers, which causes myoglobin to be released into the bloodstream making it difficult for the kidneys to filter waste. Rhabdomyolysis can develop in hot and humid climates, especially when performing intense exercise. Increased heat index levels and increased creatine supplement use during intense conditioning creates a cascade of cellular damage and insufficient muscle oxygenation, which can result in rhabdomyolysis. Athletic trainers need to recognize early signs of heat related illnesses in order to safely intervene. Early diagnosis and advanced medical care are crucial in the treatment of exertional rhabdomyolysis. Last year, thirteen football players from the University of Iowa were diagnosed with this condition and hospitalized following an intense practice session. It was stated that a “lack of knowledge and education on the dangers of rhabdomyolysis was a complicating factor”.

Patient: A 19-year old male football player complained of muscle cramping the first week of acclimatization protocols during preseason football practice. A reagent strip urinalysis test showed signs of dehydration (Specific Gravity >1.025) and large amounts of hematuria. After 24 hours, urinalysis showed SG = 1.005 and negative hematuria. Athlete was cleared to return to practice. Upon completion of the second practice that day, the athlete complained of muscle cramps while performing repetitive pushups. Athlete entered training room on his own, at which time his symptoms significantly worsened with increased stomach pain and full body cramping. Intervention: Immediate cooling of the athlete was performed with ice bags and ice towels to the axilla, groin, and temporal regions. Extra padding and clothing were removed. Oral rehydration was attempted, but was difficult due to increased discomfort. Full body cramps left the athlete in excruciating pain causing breathing difficulty. Emergency oxygen was administered at rate 16L/min. The athlete’s symptoms did not improve, EMS was activated and athlete was transported to the emergency department for further testing and advanced medical care. The athlete was admitted to the hospital after blood test results showed significant increase in intracellular calcium levels and elevated creatinine kinase (CK) at 2600 U/L (normal CK levels for 18yrs and older is 38-176 U/L). The athlete was released after 48 hours.

Comparative Outcome: Blood results revealed abnormally high levels of creatine phosphokinase levels, increased creatinine, and increased liver enzymes. Since CK levels were 5x the normal limit, hospital admission was necessary and saline was intravenously prescribed as well as urine output monitoring. Continuous monitoring of the athlete took place until CK levels returned to normal levels.

Conclusions: A clinical review by Sports Health states, “exertional rhabdomyolysis is a relatively uncommon condition with an incidence of approximately 29.9 per 100,000 patient years [and] can have very serious consequences of muscle ischemia, cardiac arrhythmia, and death.” Diagnosis of rhabdomyolysis can only be made through blood tests; urinalysis is an invalid diagnostic tool in assessing intracellular damage. It is critical for subjects presenting with heat illness symptoms that do not improve or worsens over a short period of time be transported to emergency department immediately for evaluation.

Clinical Bottom Line: An effective way to prevent rhabdomyolysis is by acclimatizing athletes properly in preseason training and educating them on proper hydration protocols, urine output color, and early signs and symptoms including muscle cramps and dehydration. With proper recognition, early action and advanced medical care can result in a positive outcome. The rapid decision to activate EMS and transport athlete to hospital was critical in the treatment and safe recovery of the athlete.

Word Count: 581