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General Medicine

RHABDOMYOLYSIS IN ADOLESCENT WITH LOW INTENSITY REPETITIVE EXERCISE –AN EYE OPENER TO PARENTS

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ABSTRACT Rhabdomyolysis is a potentially lethal syndrome with a wide range of metabolic and clinical aspects. It is caused by skeletal muscle injury that results in the release of myoglobin and other cellular contents into the circulatory system. The common causes are trauma, immobility, illicit drug use, medications, toxins, infections, potassium imbalance, hypothyroid or hyperthyroid states, hypothermia or hyperthermia, and some congenital muscular dystrophy. Exercise or exertion-induced rhabdomyolysis is a very uncommon entity and potentially rising among young generations amid getting perfect body shape as influenced by social platforms. However, rhabdomyolysis can lead to lethal complications, most commonly acute kidney injury leading to dialysis, disseminated intravascular coagulation (DIC), and acute compartment syndrome . Preventive measures can avoid the onset of this , and a timely diagnosis and proper management can avert life-threatening complications. This report describes a case of exertional rhabdomyolysis in an adolescent patient who presented with history of daily exercise in gym since four days . patient sought treatment for bilateral leg pain. The patient was subsequently treated with and was discharged after three days of hospital admission

KEYWORDS : Rhabdomyolysis, Adolescent, Low intensity repetitive exercise, Acute kidney injury

Case Report:

15 years male presented with complains of bilateral proximal lower limb pain, weakness and dark colour urine since four days after joining gym with history of repeated lower limb exercises. There was no history of any recent illness or any medication . Physical examination revealed temperature 36.8°C, blood pressure 110/70 mm Hg, pulse 86, and oxygen saturation 100% on room air. He was in no distress but had bilateral proximal lower extremity tenderness with non-pitting edema with mildly decreased strength and range of motion secondary to pain. Labs were significant for CPK 15885, AST 135, ALT 86. Complete blood count, urine analysis, plasma lactate ,CRP, s. creatinine, ionized calcium, serum uric acid, serum potassium, TSH, Fasting lipid profile were within normal limits. She was admitted for rhabdomyolysis, treated with a normal saline infusion as well as intravenous Lasix, antiemetics and analgesic, and discharged after three days.

DISCUSSION:

Lower extremity exercise training in gyms requires strenuous leg movements such as kick-back, squats, and prone leg bending with body-building apparatus. The heat in the gyms, dehydration, and the excessive muscle activities increase susceptibility to rhabdomyolysis .As a syndrome of skeletal muscle cell damage, rhabdomyolysis has a wide range of causative factors, all sharing a final common pathway of adenosine triphosphate (ATP) depletion and increased intracellular calcium, which leads to muscle cell death and the release of creatine kinase and heme-containing myoglobin into damaged tissues. Most instances occur in the context of a one-time trigger such as trauma, compression, prolonged immobilization, toxin exposure, or infection; however, recurrent episodes may be due to an underlying pathology such as hypothyroidism, inflammatory disorders such as polymyositis, and metabolic myopathies of lipid and glycogen metabolism. Diagnosis of rhabdomyolysis has both clinical and laboratory components and is typically marked by proximal myalgias, muscle weakness, elevation of serum CK, and myoglobinuria; gastrointestinal symptoms and fever may also be present. CK levels peak within one to three days of injury and are typically at least five times the upper limit of normal (at least 1000 international units/L). Myoglobinuria is evidenced by a urine dipstick that is positive for heme and pigmented granular casts but negative for red blood cells. Hyperkalemia, hyperphosphatemia, hyperuricemia, and hypocalcemia are also common consequences of cellular injury; thus, it is reasonable to obtain levels of these electrolytes in addition to an electrocardiogram to assess for related arrhythmias. Diagnosis may be complicated as patients may not present with muscle pain that serum creatine kinase, and myoglobin may be increased in context of normal exercise, and that myoglobin has such a short half-life that serum and urine levels may normalize within six to eight hours. The priority when treating rhabdomyolysis is the prevention of secondary complications, primarily myoglobinuria-induced nephropathy and electrolyte disturbances. Acute renal failure is uncommon at CK levels under 5,000 units/L and is best averted with aggressive fluid resuscitation in the form of isotonic saline at a rate of 1 to 2 L/hour until the plasma CK is below 5,000 unit/L, and the urine dipstick is negative. Occasionally, intravenous bicarbonate infusion and allopurinol are given to treat metabolic acidosis and hyperuricemia, respectively. Loop diuretics may be helpful in the rare context of fluid overload but carry the risk of worsening existing hypocalcemia. Severe electrolyte derangements may require hemodialysis. Recurrence in the context of minor triggers, such as recent illness, fasting, or mild exertion, is uncommon and suggests an underlying metabolic or inflammatory myopathy. Metabolic myopathies in particular are common in patients with recurrent, dynamic exertional myalgias and rhabdomyolysis, and span a wide range of defects in the metabolism of lipids and glycogen, as well as mitochondrial disorders. These pathologies can be diagnosed with further studies including serum and urine metabolic markers, electromyography, and muscle biopsy

CONCLUSION:

Although exertional rhabdomyolysis is typically caused by large-weight workouts, the disease can also be caused by low-weight workouts, as demonstrated by this case. It is the intensity of workout , not the amount of weight used , that can cause rhabdomyolysis. Physicians must be aware of this when they examine patients complaining of muscle pain and weakness associated with rhabdomyolysis. The primary cause of the disease is muscle death, which can be caused in a myriad of ways.

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