

Case Report

Lysis in the Crisis - An Unusual Presentation of COVID-19

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Introduction

Throughout history mankind has seen many pandemics such as the small pox, Spanish influenza, SARS-CoV, H1N1 and so on. In all the outbreaks mankind has been able to overcome the challenge of the disease spread by understanding the presentation and pathology of the disease and acting with appropriate measures to help control its spread [3]. As physicians we play a vital role in identifying the clinical features of the Covid-19 pandemic and hence it is important to be educated on the common and atypical presentation of the virus in the general population.

Case Report

A 70 year old Male was brought to our emergency department with complaints of fatigue, decreased oral intake along with decreased urine output with dark colored urine for a week. Patient had a medical history of Hypertension, Hyperlipidemia, Post traumatic stress disorder, cerebro-vascular accident and Benign Paroxysmal Positional Vertigo. Patient's outpatient medications included Amlodipine, Lisinopril, Atorvastatin, Aspirin and Trazodone. Vitals were significant for a temperature of 101.4. He was normotensive and found to saturating well on RA at about 95-97%. His labs revealed a white count of 7.5/cu.mm (normal value 4,500-11,000/ cu.mm) with a lymphopenia of 7.6% (normal value 20-40%). His CPK done was elevated at 1606 U/L (normal value 39-308 U/L). His creatine was found to be elevated at 1.6 (normal value 0.6-1.2 mg/dl). No other electrolyte abnormalities were detected. The urine analysis of the patient showed presence of hematuria with no red blood cells. His chest x-ray showed a possible developing infiltrate in the left lung fields. He tested positive for COVID-19. The patient was started on fluids and encouraged to increase his oral intake. The patient's Atorvastatin was held in lieu of presentation with Rhabdomyolysis. Over the course of

Abstract

COVID-19 has now become a household name among the medical fraternity all over the world. In a matter of a few months it has altered our lives in many ways than we had imagined. The fight against the deadly virus has just begun and there are still miles to go before we can contain its spread. What we can do right now is to understand the clinical presentation and pathology of the disease so that we may always remain cautious when seeing and treating patients under our care. Fever, cough, dyspnea and malaise have been the most common clinical symptoms seen in patient with COVID-19 [1]. However there has been a rise in patients presenting with symptoms which are unusual such as sputum production, headache, hemoptysis and gastrointestinal symptoms [2]. Here we aim to educate clinicians on the possibility of seeing patients present with Rhabdomyolysis as an initial feature of COVID-19.

Keywords: Rhabdomyolysis, COVID-19

his treatment he was initiated with oxygen therapy via nasal cannula due to desaturation to the low 90's on room air. Over the course of his admission at our facility, the patient showed improvement of his rhabdomyolysis with a decreasing trend of CPK and his kidney function returned to baseline at 1.0. Patient reported improvement of his urine output and did not report fatigue. Patient was found to saturating above 97% on room air at the time of his discharge.

Discussion

Clinically, Rhabdomyolysis is a condition which is seen due to the destruction of the muscle fibers. There are numerous causes for muscle injury leading to dissolution of muscle fibers. The most commonly encountered causes are direct muscle injury, toxins or drugs, viral or bacterial infections, endocrine disorder like hypo or hyper thyroidism, diabetic keto-acidosis [4]. In our patient, the possible factor would include the use of Atorvastatin or COVID-19. Though statin induced myopathy and rhabdomyolysis is a side effect of the medication, it is seen that the onset of Rhabdomyolysis in a patient is commonly due to concurrent use of other cytochrome p450-3A4 inhibitors such as macrolides, Azole group of antifungal, protease inhibitors, calcium channel blockers and some of the antipsychotic agents [5]. Our patient did not have a history of concurrent use of any of the drugs mentioned above. Furthermore, it has been noted in a study conducted by the U.S Food and Drug Administration that showed a higher incidence of statin induced rhabdomyolysis when the patient was prescribed statin with a dose of 80 mg and above or in conjunction with a CYP3A4 inhibitor [6]. Our patient was taking a low dosage of 40 mg daily. Hence it is more likely that the onset of Rhabdomyolysis in our patient would be the COVID viral infection.

At this juncture virus induced rhabdomyolysis is an important point of interest. It has been noted that some of the most common

Table 1: Decrease in Creatine Kinase levels in our patient.

03/30/20	03/31/20	04/01/20	04/02/20	04/03/20	04/04/20
1606	1335	957	474	261	179

viruses that cause rhabdo include Influenza, HIV and Enterovirus [7]. Other viral organisms include Epstein Barr virus, Coxsackie virus, echo virus, cytomegalovirus, adenovirus and herpes simplex virus. The two postulated theories of virus induced rhabdo include the muscle fiber invasion by the organism and the direct effect of toxins produced by the virus. Of these two, the direct invasion is the more popular choice among academics [8]. Our patient tested positive for the novel corona virus while his respiratory panel was negative for influenza and other common respiratory viral organisms.

The symptoms usually seen in patient with rhabdomyolysis include muscle pain, weakness or fatigue, dark colored urine along with the laboratory finding of elevated Creatine Kinase more than five to ten times the normal limits [9]. Our patient presented with fatigue and dark colored urine. The diagnosis however would be complete with the presence of laboratory evidence in addition to clinical symptoms. The patient labs showed a Creatine Kinase of 1606. The creatine kinase is said to be elevated when it is 1.5 times the higher limit of normal as per the European federation of Neurological Sciences [10]. The other clinching point is the presence of acute kidney injury along with the above mentioned features. One of the possible explanation for rhabdomyolysis induced acute kidney injury is the accumulation of myoglobin which is nephrotoxic along with possible decreased perfusion to the kidney [11]. In our patient his creatine was found to be elevated from his baseline to about 1.6. In addition there was a h/o decreased oral intake reported which could be the additional insult to the perfusion mechanism of the kidney leading to increased damage. Urine analysis is an important diagnostic tool in this scenario. Our patient's urine analysis revealed gross hematuria but no presence of RBC's on analysis which is supportive evidence for confirming rhabdomyolysis. This is due to the accumulation of the myoglobin protein in the kidney leading to excretion in the urine [12].

The treatment for Rhabdomyolysis is focused mainly on adequate fluid resuscitation, removal of the causative agent and prevention of possible complications. Our patient was treated with IV hydration and temporarily withholding his statin to prevent any further damage to his kidney. His CK levels along with his renal functions were trended regularly to ensure that he did not have permanent kidney damage due to rhabdomyolysis. The aim of fluid management is to washout the toxic myoglobin and ensures adequate urine output [13]. This is followed by the decrease in Creatine Kinase levels in our patient as seen in table 1.

At the end of six days his creatine kinase levels had dropped to 179 indicating that his muscle injury ad resolved. His renal function had also improved significantly with his creatine levels dropping to 1.0 from the initial presentation of 1.6.

Thus the patient who presented with COVID-19 induced myopathy was discharged after appropriate treatment and resolution of his initial symptoms.

Conclusion

It is important for us clinicians to be vigilant in the face of the current global pandemic. While the COVID-19 presents itself with many faces, it is educative for us to learn that Rhabdomyolysis could be another atypical presentation. It is appropriate at this juncture to mention that more studies are needed to support our theory of COVID-19 induced rhabdomyolysis. Appropriate resuscitation with fluids and treatment of the virus itself leads to good prognostic outcomes for the patient.

References

1. Kulachanya Suwanwongse, Nehad Shabarek. Rhabdomyolysis as a Presentation of 2019 Novel Coronavirus Disease. 2020; 12: e7561.
2. Gao QY, Chen YX, Fang JY. 2019 Novel coronavirus infection and gastrointestinal tract. *J Dig Dis.* 2020; 21: 125-126.
3. Devanand Anantham, Wendy McHugh, Stephen O'Neill, and Lachlan Forrow. Clinical review: Influenza pandemic - physicians and their obligations. *Crit Care.* 2008; 12: 217.
4. Cervellin G, Comelli I, Lippi G. Rhabdomyolysis: historical background, clinical, diagnostic and therapeutic features. *Clin Chem Lab Med.* 2010; 48: 749-756.
5. Neuvonen PJ, Niemi M, Backman JT. Drug interactions with lipid-lowering drugs: mechanisms and clinical relevance. *Clin Pharmacol Ther.* 2006; 80: 565-581.
6. U.S. Food & Drug Administration (FDA) FDA Drug Safety Communication: New Restrictions, Contraindications, and Dose Limitations of Zocor (simvastatin) to reduce the Risk of Muscle Injury Additional Information for Healthcare Professionals. 2011.
7. Upinder Singh, W. Michael Scheld. Infectious Etiologies of Rhabdomyolysis: Three Case Reports and Review. *Clinical Infectious Diseases.* 1996; 642-649.
8. Poels PJ, Ewals JA, Joosten EM, Van Loon AM. Rhabdomyolysis associated with simultaneous Epstein-Barr virus infection and isolation of echovirus 6 from muscle: a dual infection [letter]. *J Neurol Neurosurg Psychiatry.* 1989; 52: 412-414.
9. Bagley WH, Yang H, Shah KH. Rhabdomyolysis. *Intern Emerg Med.* 2007; 2: 210-218.
10. Kyriakides T, Angelini C, Schaefer J, S Sacconi, G Siciliano, J J Vilchez, et al. European Federation of Neurological Societies. EFNS guidelines on the diagnostic approach to pauci- or asymptomatic hyper CKemia. *Eur J Neurol.* 2010; 17: 767-773.
11. Khan FY. Rhabdomyolysis: a review of the literature. *Neth J Med.* 2009; 67: 272-283.
12. Cervellin G, Comelli I, Lippi G. Rhabdomyolysis: historical background, clinical, diagnostic and therapeutic features. *Clin Chem Lab Med.* 2010; 48: 749-756.
13. Criddle L. Rhabdomyolysis. Pathophysiology, recognition, and management. *Critical Care Nurse.* 2003; 23: 14-22.