

Unusual Presentation of Rhabdomyolysis & Acute Kidney Injury in a Young Patient with Associated Pancreatitis of Un-Known Etiology

Arif Noormohammed Thekiya*, Ahmed Salah Eid¹, Aalya Mohamed¹, Magdoleen Ibrahim A. Sabbah¹, Ali Aziz¹, Waleed H. Flayyih¹, Sameh Mohamed¹, Rehan Ahmed¹, Alaa Bbiker M. Ahmed¹

¹Department of Medicine, Northern Emirates Hospital, UAE

DOI: [10.36348/sjm.2023.v08i10.002](https://doi.org/10.36348/sjm.2023.v08i10.002)

Received: 25.08.2023 | Accepted: 03.10.2023 | Published: 15.10.2023

*Corresponding Author: Arif Noormohammed Thekiya
Adjunct Clinical Faculty, Faculty of Medicine, Affiliated to Univeristy of Sharjah.

Abstract

A case of 41-year-old patient presented with left lower leg cellulitis, laboratory investigations showed elevated CK levels of more than 193000 U/L, high pancreatic enzymes level namely amylase & lipase, significant electrolyte and acid base abnormalities. Diagnosis of Rhabdomyolysis made based on CK level results in acute pancreatitis. This patient developed acute renal failure with all above in mind, he stayed inpatient for 19 days. The purpose of this case report is to highlight the unusually high CK with unusual association of acute pancreatitis leading to rhabdomyolysis and the associated morbidity.

Keywords: Cellulitis, Rhabdomyolysis, Creatinine Kinase, Acute Kidney Injury, Pancreatitis.

Copyright © 2023 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

BACKGROUND

Rhabdomyolysis is a condition of acute or subacute onset in which a patient develops localized or generalized myalgia and weakness with elevated creatinine kinase (CK) level. A systematic review literature of rhabdomyolysis states that these clinical symptoms combined with a cut-off value of CK >1000 IU/L or CK > 5 times upper limit of normal (ULN) as mild to moderate rhabdomyolysis. If myoglobinuria and acute kidney injury (AKI) is also present it is considered as severe rhabdomyolysis [1].

In the past observation of dark colored urine due by myoglobinuria has been considered an important clinical feature for diagnosis of rhabdomyolysis. In one case study as many as 80% of adults had dark urine [2].

Elevated liver enzymes are frequently observed in cases of severe rhabdomyolysis. However, muscles can also be a source of the increased aminotransferase activity namely AST more than ALT [3].

Rhabdomyolysis begins with muscle injury which is commonly due to trauma, medications, exertion, infection, prolonged immobilization, illicit drug abuse or heat stroke with morbidity as high as 34% & with severe

complications leading to AKI mortality rate could reach up to 60% [4, 5].

CASE REPORT

A 41-year-old UAE national, male patient with past medical history of Hypertension not on any medications who presented with left lower limb swelling & redness 2 days' duration, preceded by lower abdominal pain, fever, poor appetite, and constipation. There were no urinary complaints, nausea, vomiting, cough, or any other constitutional symptoms. Patient denied history of drug or alcohol abuse, trauma, recent travel, heavy or strenuous exercise. Not a smoker. He was afebrile, tachycardia, BP 163/113, Morbidly obese, Bilateral mild LL edema left >right with redness and warmth on left leg below knee up to ankle. He was conscious, alert and co-operative. Respiratory, abdominal and neurological examination unremarkable.

He was Investigated with laboratory and radiology found to be in acute renal failure with abnormally high liver enzymes and high creatinine kinase of 100000 U/L, CK level peaked during his hospital stay and it became too high for the lab to quantify. [6] Blood and Urine cultures back negative after 5 days.

The other Laboratory results are shown in Table 1. Left lower limb Doppler US showed edema in the calf area suggestive of cellulitis, but no evidence of DVT. US Abdomen revealed fatty liver changes, bilateral renal loss of the corticomedullary differentiation and simple left renal cyst. Chest X ray was normal.

He was started on fluids and broad-spectrum antibiotics for cellulitis and admitted to the medical ward. In view of acute renal failure, high amylase, lipase

and raised liver enzymes, CK was requested & found to be high. On day 4 patient was moved to ICU as he started to have tachypnea secondary to metabolic acidosis. He was managed there with 7 sessions of hemodialysis with subsequent correction of his electrolytes and metabolic derangements. After 19-day hospital stay, he was clinically stable with improved renal function and CK levels. Renal parameters were completely normal upon follow up at nephrology clinic 4 weeks after discharge.

Table 1: Laboratory Investigations

LABS ↓	DATE →	31/1/2022	03/2/22	05/2/22	07/2/22	10/2/22	13/2/22	15/2/22	17/2/22	17/3/22
HB g/dl		14.8		12.4		10.5		9.8	10.3	10.6
WBC (4000-10000cells/mcL)		19800		18700		20700		10300	10400	11700
CRP (0 to 8.2mg/L)		214	177	73	19.4	21.6	7.3			18
LDH (135-225 U/L)			8936		438		255	227		
AST (0-40U/L)			1216		138		32			
ALT (0-41U/L)			166		80		33			
GGT (10-71U/L)			55							
Amylase (28-100U/L)			626	471		389				
Lipase (13-160U/L)			1527	1396		1069	293		176	83
Creatinine (62-115 umol/L)		441	978	911	903	706	619	533	393	88
Uric Acid (210-420umol/L)			1100		1124	418	638	419		343
CK (20-200U/L)			>114095	>193001	85907	13589	659	270		
K (3.5-5mmol/L)		3.7	5.9	5.3	5.7	4.9	4.2	3	3.9	3.2
Phosphorus (0.87-1.45 mmol/L)			3.79		2.18		1.61			
Alcohol (0 to 2.2mmol/L)		<2.2								
Urine –Drug Screen		NEGATIVE								
Urine-Microscopy		6-8 WBC/HPF	40-50 RBC/HPF	NO CASTS						
Blood culture X 2, URINE culture X 1				NEGATIVE						
SARS Covid-PCR		NEGATIVE								
ANTI GBM, ANA Profile, C3/C4				NEGATIVE						

DISCUSSION

Rhabdomyolysis can be caused by various conditions. While it was previously believed to be primarily result from trauma, non-traumatic causes are now observed to be at least five times more common [6]. When individuals experience symptoms, they may manifest the classic triad of muscle pain, weakness, and discolored urine or oliguria. Alternatively, they may exhibit nonspecific signs like fatigue, nausea, vomiting, fever, or confusion [6]. Acute kidney injury occurs in a significant percentage (33-50%) of rhabdomyolysis patients, with serum CK levels serving as the most reliable laboratory parameter for diagnosis.

Our patient who is morbidly obese, presented with cellulitis in the left lower limb, acute renal failure, along with electrolyte imbalances and acid-base

disruptions secondary to severe rhabdomyolysis. It's crucial to highlight that factors other than sepsis could have caused the acute renal failure. Detecting his elevated amylase, lipase, and rhabdomyolysis-induced acute renal failure would have been challenging without checking creatinine kinase (CK) levels. These coexisting conditions significantly raise both morbidity and mortality rates. Therefore, it is imperative that CK levels be promptly assessed in cases with risk factors and appropriate clinical contexts to identify rhabdomyolysis early on [6].

In our patient there was no clear cause to have acute pancreatitis, though his renal parameters, LDH, Amylase/Lipase and elevated Liver enzymes all settled with supportive treatment including renal replacement therapy. Nevertheless, when it comes to severe cases of

rhabdomyolysis leading to significant acute kidney injury accompanied by electrolyte imbalances and excess fluid retention, there are no alternative therapies available besides renal replacement therapy. Continuous renal replacement therapy stands out as the optimal choice for myoglobin removal compared to peritoneal dialysis and intermittent hemodialysis. It has been documented that continuous renal replacement therapy is employed in a range of 8% to 41% of rhabdomyolysis cases, with a higher frequency among patients experiencing hemodynamic disturbances [5].

In cases of severe acute pancreatitis, elevated levels of creatinine kinase can be detected with evidence of myocardial involvement & hypotension [7].

The occurrence of rhabdomyolysis alongside acute pancreatitis is uncommon and has been associated with factors like bacterial or viral infections, alcohol or drug misuse, typically in cases of severe disease. In rare instances, acute pancreatitis may be linked to rhabdomyolysis when other common underlying causes are ruled out [8].

CONCLUSION

Rhabdomyolysis can be life threatening with significant morbidity and mortality due to the complications, and in our case it resulted in acute pancreatitis. Clinicians might have low threshold to think about rhabdomyolysis in the presence of risk factors in such cases. Detailed history and clinical evaluation with early recognition of this condition might reduce the complications and avoid unnecessary investigations.

In conclusion, careful history, proper diagnosis & timely management with multi-disciplinary approach might prevent such life threatening diseases [6].

Conflict of interest: None declared

REFERENCES

1. Gupta, A., Thorson, P., Penmatsa, K. R., & Gupta, P. (2021). Rhabdomyolysis: revisited. *The Ulster Medical Journal*, 90(2), 61-69.
2. Nance, J. R., & Mammen, A. L. (2015). Diagnostic evaluation of rhabdomyolysis. *Muscle & Nerve*, 51(6), 793-810. doi:10.1002/mus.24606.
3. Lim, A. K. (2020). Abnormal liver function tests associated with severe rhabdomyolysis. *World journal of gastroenterology*, 26(10), 1020-1028. doi:10.3748/wjg.v26.i10.1020.
4. Weibrecht, K., Dayno, M., Darling, C., & Bird, S. B. (2010). Liver aminotransferases are elevated with rhabdomyolysis in the absence of significant liver injury. *Journal of Medical Toxicology*, 6, 294-300. doi:10.1007/s13181-010-0075-9.
5. Li, X., Bai, M., Yu, Y., Ma, F., Zhao, L., Li, Y., ... & Sun, S. (2022). Earlier continuous renal replacement therapy is associated with reduced mortality in rhabdomyolysis patients. *Renal Failure*, 44(1), 1753-1763. doi:10.1080/0886022X.2022.2132170
6. Stanley, M., Chippa, V., & Aeddula, N. R. Rhabdomyolysis. [Updated 2022 Apr 1]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK448168/>
7. Sheibani, M., Hajibaratali, B., & Yeganegi, H. (2022). Elevation of creatine kinase in acute pancreatitis: A case report. *Clinical Case Reports*, 10(2), e05309. <https://doi.org/10.1002/ccr3.5309>
8. Oikonomou, T., Doumtsos, P., & Cholongitas, E. (2017). Acute pancreatitis and rhabdomyolysis: a rare association. *Hippokratia*, 21(2), 112.