



Case Report

A Case of Statin-Induced Rhabdomyolysis in a 45-Year-Old Patient with Chronic Kidney Disease

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Abstract

Statin-induced rhabdomyolysis is a rare but potentially life-threatening condition, especially in patients with chronic kidney disease (CKD). This case report describes a 45-year-old male with CKD stage 5 who developed severe muscle pain, weakness, and dark urine after six months of atorvastatin therapy for dyslipidemia. Laboratory findings revealed markedly elevated creatine kinase (CK) levels, myoglobinemia, and myoglobinuria. Atorvastatin was immediately discontinued, and the patient received aggressive intravenous hydration. His symptoms and CK levels gradually improved without acute kidney injury. This case underscores the importance of vigilance in prescribing statins to CKD patients and highlights the need for prompt recognition and management of rhabdomyolysis. Clinicians should prioritize alternative lipid-lowering strategies for high-risk patients.

Keywords: Rhabdomyolysis, Statins, Chronic Kidney Disease, Adverse Drug Reaction.

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Introduction

Rhabdomyolysis is a serious condition characterized by the breakdown of skeletal muscle fibers, leading to the release of muscle contents into the bloodstream. Statin-induced rhabdomyolysis is rare but can be life-threatening, especially in patients with CKD. This case highlights the clinical presentation and management of statin-induced rhabdomyolysis.

The CKD patients are at increased risk of statin-induced rhabdomyolysis due to impaired drug metabolism and clearance. Understanding this case provides insights into the early recognition, management, and prevention of this severe adverse effect. It emphasizes cautious statin use and the need for alternative lipid-lowering strategies in high-risk populations. In light of above objective of this study is to describe the clinical presentation, diagnosis, and management of statin-induced rhabdomyolysis in a patient with chronic kidney disease, emphasizing early recognition and preventive strategies

Case Presentation

A 45-year-old male with a medical history of hypertension, type 2 diabetes mellitus, and CKD stage 5 (baseline estimated glomerular filtration rate [eGFR] of about 15mL/min/1.73m²) presented to the emergency department of Khyber Teaching hospital, Peshawar with complaints of severe muscle pain, weakness, and dark urine for the past two days. He had been prescribed atorvastatin 20 mg daily for the past six months for the management of dyslipidemia.

On examination, the patient was febrile (temperature 38.5°C) with generalized muscle tenderness and weakness. Laboratory investigations revealed markedly elevated creatine kinase (CK) levels of 13,000 U/L (normal range: 30-200 U/L), myoglobinemia, and myoglobinuria. His serum creatinine was 8.5 mg/dL (baseline: 1.8 mg/dL), and urine dipstick showed positive for blood without red blood cells on microscopy.

A diagnosis of statin-induced rhabdomyolysis was suspected, and atorvastatin was immediately discontinued. The patient was started on aggressive intravenous hydration with isotonic saline to prevent acute kidney injury (AKI) secondary to myoglobinuria. He was also given analgesics for pain relief and monitored closely for electrolyte abnormalities and renal function.

Over the next few days, the patient's muscle pain and weakness gradually improved, and his CK levels started to trend down. His renal function remained stable without evidence of AKI. Repeat urine tests showed resolution of myoglobinuria. The patient was advised against rechallenging with statins and was counseled on lifestyle modifications and dietary interventions for dyslipidemia.

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Parameters in the table, including urea, creatinine, potassium, liver function tests (LFTs), and urine analysis results (R/E refers to routine examination) in tabulated form

Date (Jan,2024)	CPK Levels (U/L)	LDH Levels (U/L)	Urea (mg/dL)	Creatinine (mg/dL)	Potassium (mmol/L)	LFTs (AST/ALT) U/L	Urine R/E
1 st Week	4325	800	396	8.5	7.5	315/58	Hematuria, proteinuria,myoglobinuria
2 nd Week	3098	552	233	6	4.6	200/40	Hematuria, proteinuria
3 rd Week	2234	450	169	5.5	4.7	156/27	Microscopic hematuria
4 th Week	557	267	150	5	4	89/28	Microscopic hematuria

Discussion

Statin-induced rhabdomyolysis is a rare but potentially life-threatening complication, particularly in patients with CKD. The underlying mechanisms include impaired statin metabolism, decreased renal clearance of statins and their metabolites, and altered muscle cell function in the

setting of renal dysfunction. Early recognition and prompt discontinuation of statins are crucial in managing this condition.

Meta-analysis from different regions has shed light on the incidence and risk factors associated with statin-induced rhabdomyolysis. A study conducted in the UK by Thompson et al.³ reported an increased risk

Table Classification of Statin Therapies

Statin	High-Intensity Lowers LDL >50%	Moderate-Intensity Lowers LDL 30% to 49%	Low-Intensity Lowers LDL <30%
Atorvastatin	40 mg - 80 mg	10 mg - 20 mg	
Rosuvastatin	20 mg - 40 mg	5 mg - 10 mg	
Lovastatin		40 mg	20 mg
Simvastatin		20 mg - 40 mg	10 mg
Pravastatin		40 mg - 80 mg	10 mg - 20 mg
Fluvastatin (XL)		80 mg	
Fluvastatin		40 mg (twice daily)	20 mg - 40 mg
Pitavastatin		2 mg - 4 mg	1 mg

LDL = Low Density Lipoprotein.

Source: Circulation. 2013; 129(95 suppl 2): S1-S45.

of rhabdomyolysis in patients with CKD receiving high-dose statin therapy, emphasizing the need for cautious prescribing practices in this population.

Similarly, research from the USA, such as the study by Smith et al.,⁴ highlighted the importance of monitoring CK levels in patients on statins, especially those with pre-existing renal impairment. The study found a higher incidence of rhabdomyolysis in patients with CKD compared to those with normal renal function.

In contrast, studies from Europe, including the work by Müller et al.⁵ have focused on genetic predispositions and drug interactions contributing to statin-related muscle toxicity. These studies have identified specific gene variants and drug combinations that may increase the risk of rhabdomyolysis in susceptible individuals, leading to personalized approaches in statin therapy.

In our case, the patient presented with classic symptoms of rhabdomyolysis, including severe muscle pain, weakness, and dark urine, along with significantly elevated CK levels. The temporal association with atorvastatin use, absence of other identifiable triggers, and resolution of symptoms after statin cessation supported the diagnosis of statin-induced rhabdomyolysis.

Management primarily involves supportive care with hydration to prevent AKI, pain control, and monitoring for electrolyte disturbances. Rechallenging with statins is generally contraindicated in such cases. Patients should be educated about the potential risks of statin therapy, especially in the presence of CKD, and alternative lipid-lowering strategies should be considered.

Conclusion

Statin-induced rhabdomyolysis is a rare but serious complication that can occur in patients with CKD. Clinicians should maintain a high index of suspicion, especially in patients presenting with muscle symptoms and elevated CK levels while on statin therapy. Early recognition, discontinuation of statins, supportive care, and patient education are essential for optimal management and prevention of complications. Alternative lipid-lowering strategies should be explored in patients at high risk for statin-related adverse events.

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FB: Conception

IK, AK: Design of the work

BM, NA: Data acquisition, analysis, or interpretation

IK, AK, NA: Draft the work

FB, BM: Review critically for important intellectual content

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