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Severe Exercise-Induced Rhabdomyolysis Requiring Hospitalization in a Mother and Daughter Following a Single High-Intensity Spinning Session: A Case Report

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Abstract

Exercise-induced rhabdomyolysis results in the release of Creatine Phosphokinase (CPK) and myoglobin into the bloodstream, causing muscle pain, weakness, and dark-colored urine. Severe presentations requiring hospitalization are uncommon, and simultaneous occurrence in family members is particularly rare. We report a case of severe rhabdomyolysis in a mother and daughter following a single high-intensity exercise session.

Introduction

Exercise-induced rhabdomyolysis is a condition characterized by acute skeletal muscle breakdown following intense physical activity, resulting in the release of creatine phosphokinase (CPK) and myoglobin into the bloodstream. Typical symptoms include muscle pain, weakness, swelling, and dark-colored urine [1–3].

While most cases are mild, severe rhabdomyolysis requiring hospitalization is rare, and simultaneous occurrence in family members has been scarcely reported.

We present a rare case of simultaneous exercise-induced rhabdomyolysis in a 48-year-old mother and her 20-year-old daughter following a single high-intensity spinning session in Brazil. Laboratory evaluation revealed markedly elevated CPK levels in both patients, accompanied by transient elevations in AST (TGO) and ALT (TGP), and mild urinary abnormalities, consistent with acute muscle injury without renal impairment.

Case Presentation

We report a 20-year-old female and her 48-year-old mother, both previously healthy, with no comorbidities and not taking any medications. Both developed severe thigh muscle pain, generalized weakness, and dark-colored urine within 72 hours after a single 45-minute high-intensity spinning session. On physical examination, both patients presented with tenderness and mild swelling of the thighs.

Methods (Differential diagnosis, investigations and treatment): Below are the daughter's laboratory results (Table 1). To better visualize the trend in muscle enzyme elevation, the daughter's CPK levels over time are presented in (Figure 1). The daughter's laboratory findings reflect acute skeletal muscle injury induced by high-intensity exercise. Her CPK peaked at 20,863 U/L, indicating significant muscle fiber breakdown, and declined rapidly over the following days, allowing safe discharge once clinical and laboratory improvement was observed [1,2].

Table 1: Laboratory values of the daughter over time.

Daughter - Laboratory Results					
Investigations	May 9, 2024	May 10, 2024	May 11, 2024	May 12, 2024	Reference Range
Lymphocytes	3,098.25/µL	4,128.7/µL	–	–	1,000 µL– 3,000 µL
CPK	6,551 U/L	20,863 U/L	7,487 U/L	3,160 U/L	30 U/L–135 U/L
TGO/AST	80 U/L	236 U/L	–	–	14 U/L–36 U/L
TGP/ALT	Within Normal Limits	88 U/L	–	–	<35 U/L
Mean Platelet Volume (MPV)	–	10.4 fL	–	–	5,0-10,0
Urinalysis:	–	–	–	–	–
Epithelial cells	–	3,200/ml	–	–	–
Leukocytes	–	2,100/ml	–	–	–
RBCs	–	1,000/ml	–	–	–
Protein and hemoglobin	–	Mild	–	–	–

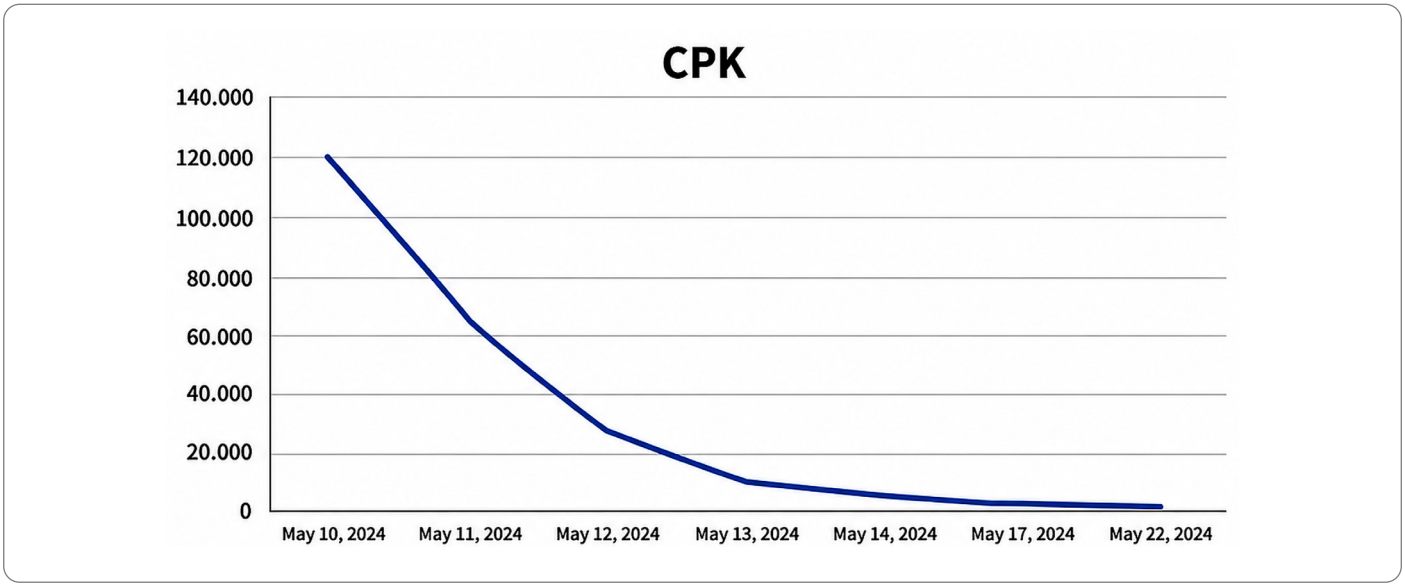


Figure 1: The evolution of the daughter's CPK levels over time.

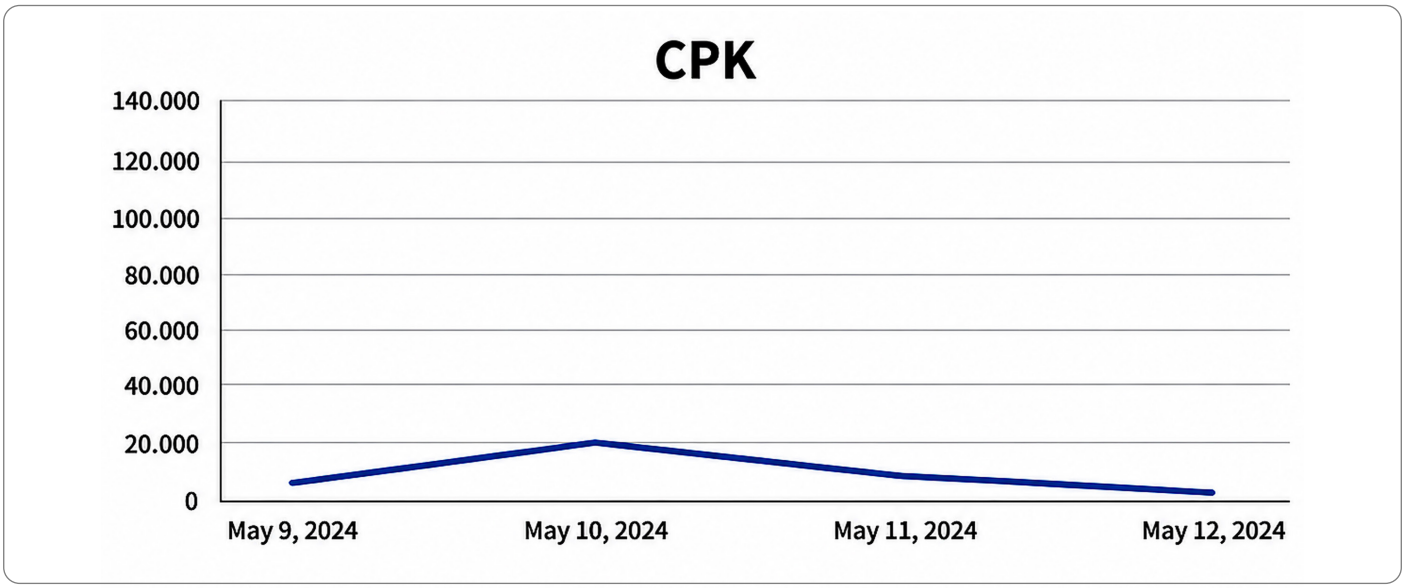


Figure 2: The evolution of the mother's CPK levels over time.

AST (TGO) and ALT (TGP) elevations were mild and paralleled CPK levels, suggesting a muscle origin rather than hepatic injury [3,4]. Mild lymphocytosis likely reflects a transient inflammatory or stress response [5]. Urinalysis showed mild proteinuria and hematuria, consistent with muscle breakdown products. Renal function remained normal, likely due to early hydration and monitoring [2,6].

Below are the mother's laboratory results (Table 2). To better visualize the trend in muscle enzyme elevation, the mother's CPK levels over time are presented in (Figure 2). In the mother, laboratory findings were more pronounced, reflecting severe muscle injury. Her CPK peaked at 119,428 U/L, with parallel elevations in AST (TGO) and ALT (TGP), consistent with muscle-derived enzyme release rather than primary hepatic injury [3,4].

Mild neutrophilia was observed, likely representing a systemic inflammatory response [5]. Urinalysis findings were similar to the daughter's, with mild proteinuria and hemoglobinuria. Renal function remained preserved due to timely supportive management [2,6].

CPK levels gradually normalized over approximately 12 days, demonstrating complete recovery with appropriate treatment.

Discussion

Exercise-induced rhabdomyolysis is characterized by skeletal muscle breakdown following intense physical activity, leading to the release of intracellular components, including CPK, myoglobin, and transaminases, into the bloodstream [1,2]. While mild cases are relatively common, severe rhabdomyolysis requiring hospitalization is rare. Simultaneous occurrence in family members is extremely unusual.

Both patients in this report developed significant elevations in CPK following a single high-intensity spinning session. The simultaneous presentation suggests a possible familial or genetic predisposition, although no specific underlying disorder was identified. Early recognition and management are essential to prevent complications, particularly acute kidney injury. Treatment consisted of aggressive intravenous hydration, laboratory monitoring, and supportive care, resulting in full recovery.

Table 2: Laboratory values of the mother over time.

Mother - Laboratory Results								
Investigations	May 10, 2024	May 11, 2024	May 12, 2024	May 13, 2024	May 14, 2024	May 17, 2024	May 22, 2024	Reference Range
Neutrophils	7,930.57/µL	–	–	–	–	–	–	3,000–7,000
Segmented Neutrophils	7,709.97/µL	–	–	–	–	–	–	2,900–6,300
CPK	119,428 U/L	63,584 U/L	27,840 U/L	10,217 U/L	3,972 U/L	798 U/L	172 U/L	30 U/L–135 U/L
TGO/AST	1,534 U/L	–	–	–	–	38 U/L	–	14 U/L–36 U/L
TGP/ALT	457 U/L	–	–	–	–	79 U/L	–	<35 U/L
Urinalysis:	–	–	–	–	–	–	–	–
Protein	15 mg/dl	–	–	–	–	–	–	–
Hemoglobin	0.75 mg/dl	–	–	–	–	–	–	–
Epithelial cells	9,300/ml	–	–	–	–	–	–	–
Leukocytes	1,800/ml	–	–	–	–	–	–	–
RBCs	2,500/ml	–	–	–	–	–	–	–
Mucus	Present	–	–	–	–	–	–	–

Conclusions

Exercise-induced rhabdomyolysis can occur even in previously healthy individuals after a single high-intensity exercise session. Although most cases are mild, severe presentations requiring hospitalization may occur. This case highlights the importance of early recognition and management to prevent complications. Additionally, the simultaneous occurrence in related individuals suggests a possible familial susceptibility warranting further investigation.

Key Clinical Message

Exercise-induced rhabdomyolysis can occur in previously healthy individuals after a single high-intensity exercise session. Severe rhabdomyolysis occurring simultaneously in family members is extremely rare. We present a unique case involving a mother and daughter.

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Data availability: The de-identified laboratory test results from this case report are available from the corresponding author upon reasonable request. (Caio Bolfer da Silva and Larissa Cuminati Delatorre contributed equally to the work and should be considered co-first authors).

Authors' contributions: All authors contributed equally.

Disclosures

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Conflict of Interest

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. Informed consent was obtained for this publication.

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