Acute renal failure in two cases with hypothyroidism related rhabdomyolysis

Davut Akin, Sehmus Ozmen

ABSTRACT

Introduction: We describe two cases of acute renal failure due to rhabdomyolysis associated with hypothyroidism. Hypothyroidism usually leads to muscular disorders, otherwise rhabdomyolysis is quite rare.

Case Series: This case report describes two cases of acute renal failure due to rhabdomyolysis associated with hypothyroidism in a 72-year-old male and a 36-year-old female in whom muscle enzyme levels were typical of rhabdomyolysis. Other reasons of rhabdomyolysis were excluded. Renal functions were recovered in both cases after treatment.

Conclusion: Hypothyroidism must be considered in patients presenting with acute renal failure and elevated muscle enzymes even in absence of additional precipitating factor.

International Journal of Case Reports and Images (IJCRI)

International Journal of Case Reports and Images (IJCRI) is an international, peer reviewed, monthly, open access, online journal, publishing high-quality, articles in all areas of basic medical sciences and clinical specialties.

Aim of IJCRI is to encourage the publication of new information by providing a platform for reporting of unique, unusual and rare cases which enhance understanding of disease process, its diagnosis, management and clinico-pathologic correlations.

IJCRI publishes Review Articles, Case Series, Case Reports, Case in Images, Clinical Images and Letters to Editor.

Website: www.ijcasereportsandimages.com

CASE SERIES

OPEN ACCESS

Acute renal failure in two cases with hypothyroidism related rhabdomyolysis

Davut Akin, Sehmus Ozmen

ABSTRACT

Introduction: We describe two cases of acute renal failure due to rhabdomyolysis associated with hypothyroidism. Hypothyroidism usually leads to muscular disorders, otherwise rhabdomyolysis is quite rare. **Case Series:** This case report describes two cases of acute renal failure due to rhabdomyolysis associated with hypothyroidism in a 72-year-old male and a 36-year-old female in whom muscle enzyme levels were typical of rhabdomyolysis. Other reasons of rhabdomyolysis were excluded. Renal functions were recovered in both cases after treatment. **Conclusion:** Hypothyroidism must be considered in patients presenting with acute renal failure and elevated muscle enzymes even in absence of additional precipitating factor.

Keywords: Acute Renal Failure (ARF), Hypothyroidism, Rhabdomyolysis

How to cite this article

Akin D, Ozmen S. Acute renal failure in two cases with hypothyroidism related rhabdomyolysis. International Journal of Case Reports and Images 2014;5(3):195–197.

Davut Akin¹, Sehmus Ozmen²

Affiliations: ¹MD Assistant Professor, Department of Nephrology, Denizli State Hospital, 32100 Denizli, Turkey; ²Dicle University School of Medicine and Diyarbakir Memorial Hospital.

Corresponding Author: Dr. Davut Akin, Department of Nephrology, Denizli State Hospital, 32100-Denizli, Turkey; Tel: +90 05055251124; Email: drdavutakin@gmail.com

Received: 28 September 2013

Accepted: 02 November 2013

Published: 01 March 2014

doi:10.5348/ijcricri-2014-03-471-CS-2

INTRODUCTION

Rhabdomyolysis is an injury of skeletal muscle resulting in leakage of cell content into bloodstream. Although muscular disorders are usual in hypothyroidism, rhabdomyolysis due to hypothyroidism is very rare and only a few cases have been reported [1–3]. Non-exertional and non-traumatic causes of rhabdomyolysis include drugs, toxins, infections, electrolyte abnormalities, endocrinopathies, inflammatory and myopathies [4]. Most of the cases of rhabdomyolysis due to hypothyroidism and acute renal failure (ARF) had additional precipitating factor [5]. Only a few cases without precipitating factor have been reported [3, 6–9].

We present two cases with ARF due to hypothyroidism associated rhabdomyolysis with no additional precipitating factor.

CASE SERIES

Case 1: A 72-year-old male was admitted to hospital because of confusion, decreased urine output and dark brown urine color for 10 days. A physical examination revealed dry skin and generalized body swelling. His blood pressure was 90/60 mmHg and his pulse rate was 60/min, with an oral temperature 37°C. Abnormal laboratory results were as follows: serum urea 217 mg/dL (10–45 mg/dL), creatinine 11.3 mg/dL (0.6–1.3 mg/dL), K 6.5 mmol/L (3.5–5.1 mmol/L), peak creatine kinase 6024 U/L (29–200 U/L), lactate dehydrogenase (LDH) 449 U/L (125–243 U/L), aspartate aminotransferase (AST) 75 U/L (10–40 U/L), alanine aminotransferase (ALT) 24 U/L (10–35 U/L). Urine analysis revealed dark brown urine with a positive dipstick reaction for blood and granular casts. A history of hashimoto thyroiditis for 40 years was obtained from his medical records. He was not taking thyroxine replacement regularly, but hypothyroidism was detected. Serum free T₃, free T₄ and

TSH levels were 0.02 ng/dL (1.8–4.6 ng/dL), 0.065 ng/dL (0.8–1.8 ng/dL) and 100 µIU/mL (0.27–4.20 µIU/mL). He has high serum concentrations of antibodies to anti-microsomal AB and antithyroglobulin 500 U/mL (0–60 U/mL and 390 U/mL (0–20 U/mL), respectively. Other laboratory tests were normal. Intravenous fluids and L-Thyroxine replacement (100 µg/day) was started. Two sessions of hemodialysis was performed because of uremic acidosis and mental changes. Renal ultrasonography was normal. He experienced a polyuria period after thyroxine replacement. Serum creatine kinase level was normalized in a week of treatment. The final serum creatinine was 1.1 mg/dL.

Case 2: A 36-year-old female admitted with myalgia and decreased daily urine. Her blood pressure 10/70 mmHg and rhythm was normal. Abnormal laboratory results were as follows: serum urea 189 mg/dL, creatinine 10 mg/dL, serum sodium 126 mmol/L, serum potassium 5 mmol/L, AST 337 U/L, ALT 82 U/L, peak CK 4267 U/L, LDH 804 U/L. Urine analysis revealed granular casts no RBC and a positive dipstick reaction for blood. She had a history of subtotal thyroidectomy due to multinodular goiter one year ago. She was not taking thyroxine replacement regularly. Thyroid hormone profile revealed a TSH 100 µIU/mL (0.27–4.20 µIU/mL), FT3 0.1 pmol/L (3.1–7.7 pmol/L), and FT4 2.2 pmol/L (9–18 pmol/L). She had low central venous pressure. Fluids (0.09 NaCl 120 mL/hr) and bicarbonate infusion (4.2 mmol/hr) was administered intravenously. No hemodialysis was performed. Thyroxine replacement (100 µg/day) was started. Her final serum creatinine was 1.1 mg/dL, Serum creatine kinase returned normal level.

Both of the patients did not have a past medical history of diabetes, hypertension, or renal disease. Non-exertional and non-traumatic causes of rhabdomyolysis include drugs, toxins, infections, electrolyte abnormalities. Antinuclear antibodies (ANA), anti-Ro, anti-La, anti-Sm, anti-Jo-1 or anti-ribonucleoprotein (RNP) antibodies were negative. Other laboratory tests (such as lipid profile and blood sugar) were normal. Renal ultrasonography revealed normal sized kidneys with normal echogenicity. No additional precipitating factor both of patients could be related with rhabdomyolysis was detected.

DISCUSSION

This case series describes two patients suffering from rhabdomyolysis due to hypothyroidism, with no additional precipitating factor. Rhabdomyolysis was defined as creatine kinase levels above five times the upper limit of normal and renal findings in both cases. Although the main features of rhabdomyolysis are muscular symptoms and increased creatine kinase concentrations, it can become a life-threatening disorder when complicated by ARF. As a cause of rhabdomyolysis, disorders such as collagen disease (e.g., polymyositis),

ingestion of massive alcohol, other agents, infection, and trauma were excluded in our cases from medical history.

The exact cause of rhabdomyolysis (abnormal glycogenolysis, mitochondrial oxidative metabolism, and triglyceride turnover, impair muscle function) in hypothyroidism remains unclear [10].

There is a wide variation in the clinical presentation of rhabdomyolysis. The classical triad of symptoms is muscle pain, weakness, and reddish-brown urine. However, these classical features are seen in fewer than 10% of the patients [4]. One of our patients also had muscle pain, weakness, and reddish-brown urine, but the other patient did not report a muscle pain and weakness probably because of confused mental status.

Rhabdomyolysis and ARF due to hypothyroidism is a rare entity. There are a few reported cases in literature [3, 6]. In most of these cases, rhabdomyolysis appears to have been precipitated by additional factors such as vigorous exercise [2, 5], trauma, anti-hyperlipidemic agents, or metabolic disorder. Although hyponatremia is a well-known aetiology that may cause rhabdomyolysis, hyponatremia level in our second case is not as severe as previous papers reporting hyponatremia as cause of rhabdomyolysis [11]. Therefore, hyponatremia may not be the main factor of rhabdomyolysis in our case. To our knowledge only 11 cases with ARF secondary to hypothyroidism-related rhabdomyolysis who had no additional precipitating factor have been reported in literature to date [3, 6–9].

CONCLUSION

In conclusion, hypothyroidism must be considered in patients presenting with acute renal failure and elevated muscle enzymes even in absence of additional precipitating factor.

Author Contributions

Davut Akin – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Sehmus Ozmen – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

Copyright

© Davut Akin et al. 2014; This article is distributed under the terms of Creative Commons attribution 3.0 License which permits unrestricted use, distribution and reproduction in any means provided the original authors and original publisher are properly credited. (Please see www.ijcasereportsandimages.com/copyright-policy.php for more information.)

REFERENCES

1. Khaleeli AA, Griffith DG, Edwards RH. The clinical presentation of hypothyroid myopathy and its relationship to abnormalities in structure and function of skeletal muscle. *Clin Endocrinol (Oxf)* 1983;19(3):365–76.
2. Riggs JE. Acute exertional rhabdomyolysis in hypothyroidism: The result of a reversible defect in glycogenolysis? *Mil Med* 1990;155(4):171–2.
3. Kisakol G, Tunc R, Kaya A. Rhabdomyolysis in a patient with hypothyroidism. *Endocr J* 2003;50(2):221–3.
4. Giannoglou GD, Chatzizisis YS, Misirli G. The syndrome of rhabdomyolysis: Pathophysiology and diagnosis. *Eur J Intern Med* 2007;18(2):90–100.
5. Nelson SR, Phillips AO, Hendry BM. Hypothyroidism and rhabdomyolysis in a marathon runner. *Nephrol Dial Transplant* 1993;8(4):375–6.
6. Altay M, Duranay M, Ceri M. Rhabdomyolysis due to hypothyroidism. *Nephrol Dial Transplant* 2005;20(4):847–8.
7. Barahona MJ, Mauri A, Sucunza N, Paredes R, Wägner AM. Hypothyroidism as a cause of rhabdomyolysis. *Endocr J* 2002;49(6):621–3.
8. Kar PM, Hirani A, Allen MJ. Acute renal failure in a hypothyroid patient with rhabdomyolysis. *Clin Nephrol* 2003;60(6):428–9.
9. Birewar S, Oppenheimer M, Zawada ET Jr. Hypothyroid acute renal failure. *S D J Med* 2004;57(3):109–10.
10. Kaminski HJ, Ruff RL. Endocrine myopathies. In: *Myology*, 2d ed, Engel, AG, Franzini-Armstrong, C (Eds), McGraw-Hill; New York 1994, p,1741.
11. Strachan P, Prisco D, Multz AS. Recurrent rhabdomyolysis associated with polydipsia-induced hyponatremia - A case report and review of the literature. *Gen Hosp Psychiatry* 2007;29(2):172–4.

Access full text article on
other devices

Access PDF of article on
other devices

Edorium Journals: An introduction

Edorium Journals Team

About Edorium Journals

Edorium Journals is a publisher of high-quality, open access, international scholarly journals covering subjects in basic sciences and clinical specialties and subspecialties.

Invitation for article submission

We sincerely invite you to submit your valuable research for publication to Edorium Journals.

But why should you publish with Edorium Journals?

In less than 10 words - we give you what no one does.

Vision of being the best

We have the vision of making our journals the best and the most authoritative journals in their respective specialties. We are working towards this goal every day of every week of every month of every year.

Exceptional services

We care for you, your work and your time. Our efficient, personalized and courteous services are a testimony to this.

Editorial Review

All manuscripts submitted to Edorium Journals undergo pre-processing review, first editorial review, peer review, second editorial review and finally third editorial review.

Peer Review

All manuscripts submitted to Edorium Journals undergo anonymous, double-blind, external peer review.

Early View version

Early View version of your manuscript will be published in the journal within 72 hours of final acceptance.

Manuscript status

From submission to publication of your article you will get regular updates (minimum six times) about status of your manuscripts directly in your email.

Our Commitment

Six weeks

You will get first decision on your manuscript within six weeks (42 days) of submission. If we fail to honor this by even one day, we will publish your manuscript free of charge.

Four weeks

After we receive page proofs, your manuscript will be published in the journal within four weeks (31 days). If we fail to honor this by even one day, we will publish your manuscript free of charge and refund you the full article publication charges you paid for your manuscript.

Mentored Review Articles (MRA)

Our academic program "Mentored Review Article" (MRA) gives you a unique opportunity to publish papers under mentorship of international faculty. These articles are published free of charges.

Most Favored Author program

Join this program and publish any number of articles free of charge for one to five years.

Favored Author program

One email is all it takes to become our favored author. You will not only get fee waivers but also get information and insights about scholarly publishing.

Institutional Membership program

Join our Institutional Memberships program and help scholars from your institute make their research accessible to all and save thousands of dollars in fees make their research accessible to all.

Our presence

We have some of the best designed publication formats. Our websites are very user friendly and enable you to do your work very easily with no hassle.

Something more...

We request you to have a look at our website to know more about us and our services.

We welcome you to interact with us, share with us, join us and of course publish with us.

Edorium Journals: On Web

Browse Journals

CONNECT WITH US