Hypertrophic cardiomyopathy

MAY 2018

TO THE EDITOR: We read with interest the article by Young et al on hypertrophic cardiomyopathy (HCM)[1] and would like to raise a few important points.

HCM has a complex phenotypic expression and doesn't necessarily involve left ventricular outflow obstruction. Midventricular obstruction is a unique subtype of HCM, with increased risk of left ventricular apical aneurysm (LVAA) formation. We reported that 25% of HCM patients with midventricular obstruction progress to LVAA compared with 0.3% of patients with other HCM subtypes.[2] Magnetic resonance imaging plays a pivotal role in assessing midventricular obstruction, owing to asymmetric geometry of the left ventricle and the shortcomings of echocardiography in assessing the apical aneurysm.[2]

Anticoagulation remains one of the cornerstones in treating midventricular obstruction with LVAA. We performed a systematic review and found a high prevalence of atrial arrhythmia, apical thrombus, and stroke, which necessitated anticoagulation in one-fifth of patients.[2]

Ventricular arrhythmias are prevalent in midventricular obstruction with LVAA, mainly from increased fibrosis formation at the apical rim.[3] In our review, 25.7% of patients with midventricular obstruction with LVAA and an implantable cardioverter-defibrillator (ICD) experienced appropriate shocks.[2] Our finding was in line with those of Rowin et al,[3] who showed appropriate ICD shocks in one-third of HCM patients with apical aneurysm. Apical aneurysm is currently considered an independent risk factor for sudden cardiac death in HCM, with an increased rate of sudden death of up to 5% every year.[3,4]

It is imperative to distinguish midventricular obstruction with LVAA as a unique disease imposing a higher risk of thromboembolism, ventricular arrhythmia, and progression to end-stage heart failure.[3] We suggest that those patients be evaluated early in the course of disease for anticoagulation, ICD implantation, and early surgical intervention.[2]

MOUSTAFA ELSHESHTAWY, MD
Maimonides Medical Center
Brooklyn, NY

MAHMOUD ABDELGHANY, MD
State University of New York, Syracuse
Yale University
New Haven, CT

JACOB SHANI, MD
Maimonides Medical Center
Brooklyn, NY

REFERENCES

1. **Young L, Smedira NG, Tower-Rader A, Lever H, Desai MY**. Hypertrophic cardiomyopathy: a complex disease. Cleve Clin J Med 2018; 85(5):399–411. doi:10.3949/ccjm.85a.17076
2. **Elsheshtawy MO, Mahmoud AN, Abdelghany M, Suen IH, Sadiq A, Shani J**. Left ventricular aneurysms in hypertrophic cardiomyopathy with midventricular obstruction: a systematic review of literature. Pacing Clin Electrophysiol 2018 May 22. doi:10.1111/pace.13380. [Epub ahead of print].
3. **Rowin EJ, Maron BJ, Haas TS, et al**. Hypertrophic cardiomyopathy with left ventricular apical aneurysm: implications for risk stratification and management. J Am Coll Cardiol 2017; 69(7):761–773. doi:10.1016/j.jacc.2016.11.063
4. **Spirito P**. Saving more lives. J Am Coll Cardiol 2017; 69(7): 774–776. doi:10.1016/j.jacc.2016.12.010

doi:10.3949/ccjm.85c.10001

Postsurgical hypoparathyroidism is not primary hypoparathyroidism

MARCH 2018

TO THE EDITOR: I read with interest the case of a 67-year-old woman with bilateral hand numbness, published in the March 2018 issue of the *Journal*, and I would like to suggest 2 important corrections to this article.[1]

The authors present a case of hypocalcemia secondary to postsurgical hypoparathyroidism but describe it as due to primary hypoparathyroidism. The patient had undergone thyroidectomy 10 years earlier and since then had hypocalcemia, secondary to postsurgical hypoparathyroidism, that was

treated with calcium and vitamin D, until she stopped taking these agents. Postsurgical hypothyroidism is the most common cause of acquired or secondary hypoparathyroidism and is *not* primary hypoparathyroidism. I strongly feel that this requires an update or correction to the article. This patient may have associated malabsorption, as the authors alluded to, as the cause of her "normal" serum parathyroid hormone level.

The patient also had hypomagnesemia, which the authors state could have been due to furosemide use and "uncontrolled" diabetes mellitus. Diabetes doesn't need to be uncontrolled to cause hypomagnesemia. Hypomagnesemia is common in patients with type 2 diabetes mellitus, with a prevalence of 14% to 48% in patients with diabetes compared with 2.5% to 15% in the general population.[2] It is often multifactorial and may be secondary to one or more of the following factors: poor dietary intake, autonomic dysfunction, altered insulin resistance, glomerular hyperfiltration, osmotic diuresis (uncontrolled diabetes), recurrent metabolic acidosis, hypophosphatemia, hypokalemia, and therapy with drugs such as metformin and sulfonylureas.

Patients with type 2 diabetes and hypomagnesemia often enter a vicious cycle in which hypomagnesemia worsens insulin resistance and insulin resistance, by reducing the activity of renal magnesium channel transient receptor potential melastatin (TRPM) type 6, perpetuates hypomagnesemia.[3]

MALVINDER S. PARMAR, MB, MS, FRCPC, FACP, FASN
Northern Ontario School of Medicine
East Timmins, ON, Canada

REFERENCES

1. **Radwan SS, Hamo KN, Zayed AA**. A 67-year-old woman with bilateral hand numbness. Cleve Clin J Med 2018; 85(3):200–208. doi:10.3949/ccjm.85a.17026
2. **Pham PC, Pham PM, Pham SV, Miller JM, Pham PT**. Hypomagnesemia in patients with type 2 diabetes. Clin J Am Soc Nephrol 2007; 2(2):366–373. doi:10.2215/CJN.02960906
3. **Gommers LM, Hoenderop JG, Bindels RJ, de Baaij JH**. Hypomagnesemia in type 2 diabetes: a vicious circle? Diabetes 2016; 65(1):3–13 doi:10.2337/db15-1028

doi:10.3949/ccjm.85c.10002

IN REPLY: We thank Dr. Parmar and appreciate his important comments.

Regarding the difference between primary and secondary hypoparathyroidism, the definition varies among investigators. Some define primary hypoparathyroidism as a condition characterized by primary absence or deficiency of parathyroid hormone (PTH), which results in hypocalcemia and which can be congenital or acquired, including postsurgical hypoparathyroidism.[1–4] In principle, this is similar to the classification of disorders affecting other endocrine glands as primary and secondary. For example, primary hypothyroidism refers to a state of low thyroid hormones resulting from impairment or loss of function of the thyroid gland itself, such as in Hashimoto thyroiditis, radioactive iodine therapy, or thyroidectomy, among others.[5] We adopted this definition in our article. In contrast, secondary hypoparathyroidism is characterized by low PTH secretion in response to certain conditions that cause hypercalcemia. *Non-PTH-mediated hypercalcemia* is a more common term used to describe this state of secondary hypoparathyroidism.

Other investigators restrict the term "primary hypoparathyroidism" to nonacquired (congenital or hereditary) etiologies, while applying the term "secondary hypoparathyroidism" to acquired etiologies.[6]

Concerning the association between diabetes mellitus and hypomagnesemia, we agree that diabetes does not need to be uncontrolled to cause hypomagnesemia. However, the patient described in our article presented with severe hypomagnesemia (serum level 0.6 mg/dL), which is not commonly associated with diabetes. Most cases of hypomagnesemia in patients with type 2 diabetes mellitus are mild and asymptomatic, whereas severe manifestations including seizures, cardiac arrhythmias, and acute tetany are rarely encountered in clinical practice.[7] Furthermore, numerous studies have shown a negative correlation between serum magnesium level and glycemic control.[7–11] A recent study reported that plasma triglyceride and glucose levels are the main determinants of the plasma magnesium concentration in patients with type 2 diabetes.[12]

Our patient's diabetes was uncontrolled, as evidenced by her hemoglobin A_{1c} level of 9.7% and her random serum glucose level of 224 mg/dL. Therefore, it is more likely that "uncontrolled diabetes mellitus" (in addition to diuretic use) was the cause of her symptomatic severe hypomagnesemia rather than controlled diabetes mellitus.

SOHAB S. RADWAN, MD
The University of Jordan
Amman, Jordan

KHAIR M. HAMO, MD
The University of Jordan
Amman, Jordan

AYMAN A. ZAYED, MD, MSc, FACE, FACP
The University of Jordan
Amman, Jordan

■ REFERENCES

1. **Mendes EM, Meireles-Brandão L, Meira C, Morais N, Ribeiro C, Guerra D**. Primary hypoparathyroidism presenting as basal ganglia calcification secondary to extreme hypocalcemia. Clin Pract 2018; 8(1):1007. doi:10.4081/cp.2018.1007
2. **Vadiveloo T, Donnan PT, Leese GP**. A population-based study of the epidemiology of chronic hypoparathyroidism. J Bone Miner Res 2018; 33(3):478-485. doi:10.1002/jbmr.3329
3. **Hendy GN, Cole DEC, Bastepe M**. Hypoparathyroidism and pseudohypoparathyroidism. In: De Groot LJ, Chrousos G, Dungan K, et al, eds. Endotext [Internet], South Dartmouth (MA): MDText.com, Inc.; 2017. www.ncbi.nlm.nih.gov/books/NBK279165/. Accessed August 20, 2018.
4. **Rosa RG, Barros AJ, de Lima AR, et al**. Mood disorder as a manifestation of primary hypoparathyroidism: a case report. J Med Case Rep 2014; 8:326. doi:10.1186/1752-1947-8-326
5. **Almandoz JP, Gharib H**. Hypothyroidism: etiology, diagnosis, and management. Med Clin North Am 2012; 96(2):203–221. doi:10.1016/j.mcna.2012.01.005
6. **Fouda UM, Fouda RM, Ammar HM, Salem M, Darouti ME**. Impetigo herpetiformis during the puerperium triggered by secondary hypoparathyroidism: a case report. Cases J 2009; 2:9338. doi:10.1186/1757-1626-2-9338
7. **Tosiello L**. Hypomagnesemia and diabetes mellitus. A review of clinical implications. Arch Intern Med 1996; 156(11):1143–1148. pmid: 8639008
8. **Pham PC, Pham PM, Pham PA, et al**. Lower serum magnesium levels are associated with more rapid decline of renal function in patients with diabetes mellitus type 2. Clin Nephrol 2005; 63(6):429–436. pmid:15960144
9. **Tong GM, Rude RK**. Magnesium deficiency in critical illness. J Intensive Care Med 2005; 20(1):3–17. doi:10.1177/0885066604271539
10. **Resnick LM, Altura BT, Gupta RK, Laragh JH, Alderman MH, Altura BM**. Intracellular and extracellular magnesium depletion in type 2 (non-insulin-independent) diabetes mellitus. Diabetologia 1993; 36(8):767–770. pmid:8405745
11. **Pun KK, Ho PW**. Subclinical hyponatremia, hyperkalemia and hypomagnesemia in patients with poorly controlled diabetes mellitus. Diabetes Res Clin Pract 1989; 7(3)163–167. pmid: 2605984
12. **Kurstjens S, de Baaij JH, Bouras H, Bindels RJ, Tack CJ, Hoenderop JG**. Determinants of hypomagnesemia in patients with type 2 diabetes mellitus. Eur J Endocrinol 2017; 176(1):11–19. doi:10.1530/EJE-16-0517

doi:10.3949/ccjm.85c.10003