Electrocardiogram Changes in Hyperkalemia: There and Back Again

Eyal Zimlichman MD and Omer Liran

Department of Medicine B, Sheba Medical Center, Tel Hashomer, Israel

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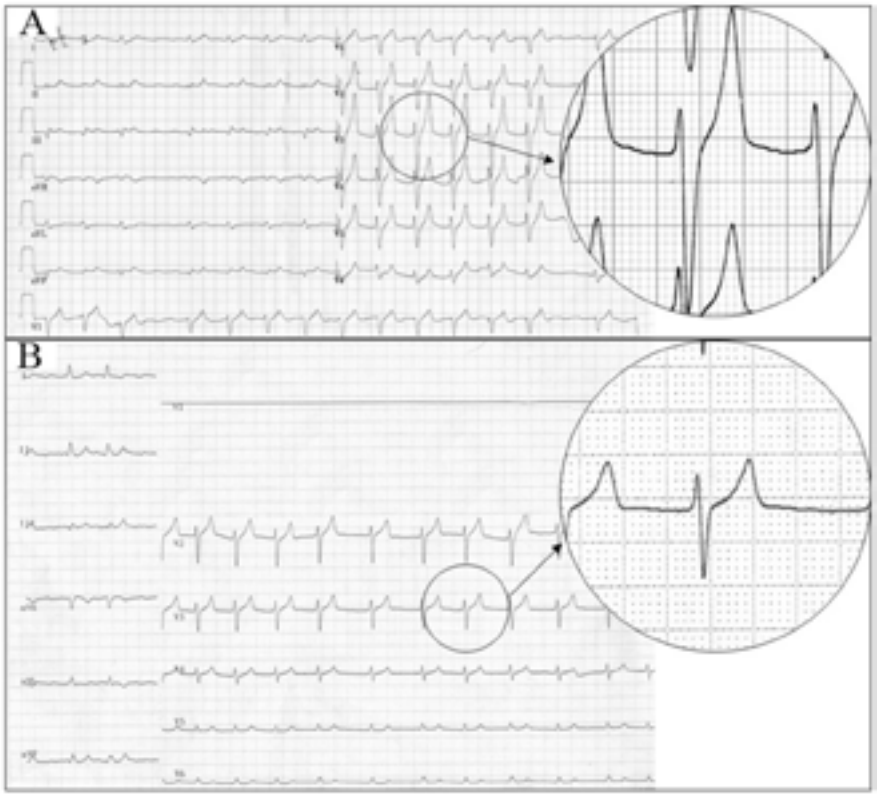
A 56 year old man presented to the emergency room with nausea, vomiting, generalized weakness, and repeated falls during the past 2 days. The patient had hypertension, congestive heart failure, chronic atrial fibrillation, and diabetes mellitus with mild diabetic nephropathy. He was being treated with enalapril, spironolactone, and insulin. On admission, his serum potassium concentration was 8.1 mEq/L, serum sodium concentration 121 mEq/L, serum urea concentration 256 mg/dl, serum creatinine concentration 3.1 mg/L, and serum glucose concentration 296 mg/dl. An electrocardiogram [Figure A] revealed atrial fibrillation (chronic) with tall peaked T-waves in leads II, AVF, and V1 to V5, and a short ST-segment was noted. Changes were related to the patient's hyperkalemia.

The patient was treated with calcium gluconate, intravenous glucose infusion with insulin, salbutamol inhalations, and polystyrene sulphonate. Twenty minutes after the calcium gluconate was injected, a second ECG [Figure B] was performed. The peaked T-waves had disappeared, the ST-segment was longer, and the QRS complex shorter in both amplitude and duration. Enalapril and spironolactone were discontinued and the patient eventually recovered from the hyperkalemic state. He was discharged a few days later with normal electrolyte and kidney function tests.



Correspondence: Dr. E. Zimlichman, Dept. of Medicine B, Sheba Medical Center, Tel Hashomer 52621, Israel.
Phone: (972-3) 530-2661
Fax: (972-3) 535-2855
email: zimlich1@zahav.net.il

Any fool can criticize, condemn and complain – and most fools do

Dale Carnegie (1888-1955), U.S. self-help teacher and author whose book *How to Win Friends and Influence People* sold millions around the world.