

## Case report

# Diarrhea Related Hypokalemia Induced Ventricular Fibrillation in A Healthy Elderly Patient

(Sağlıklı yaşlı bir hastada ishale bağlı hipokaleminin sebep olduğu ventriküler fibrilasyon)

**Fatih BUYUKCAM, Akif ALTINBAS**

**Dışkapı Yıldırım Beyazıt Eğitim ve Araştırma Hastanesi Acil Tıp Kliniği, ANKARA**

## ÖZET

İshal yaşlı hastalarda morbidite ve mortalitenin önemli sebepleri arasında yer almaktadır. Su dengesindeki bozukluklar ve azalmış sıvı alım isteği özellikle ishal durumlarında yaşlı hastalarda dehidratasyon için risk oluşturmaktadır. 62 yaşında bayan hasta acil servise bayılma sonrasında getirildi. Hastanın bir gündür devam eden ishal, bulantı ve halsizlik şikâyeti vardı. Hastanın bilinen hastalığı ve sürekli kullandığı ilaç yoktu. Başvuru anında alınan kan örneğinde potasyum seviyesi 2,6 mmol/L idi, birinci saatte potasyum verilmeye başlandı. Başvurunun ikinci saatinde hastada ventriküler fibrilasyon gelişti, resüsitasyon ile sinüs ritmi sağlandı. Hasta koroner yoğun bakıma yatırıldı, burada yapılan koroner anjiyografide birkaç küçük plak haricinde koroner arterlerin normal olduğu ve belirgin daralmanın olmadığı görüldü. Sonuç olarak, yaşlı bir hastada basit bir ishalin ventriküler fibrilasyona yol açabileceği akılda tutulmalıdır. Acil servise ishali olup dehidratasyon ve hipotansiyon belirtileri ile gelen yaşlı hastalarda sıvı ve elektrolit kaybına bağlı olarak gelişebilecek akut böbrek yetmezliği, ciddi elektrolit bozuklukları gibi olumsuz durumları gözden kaçırmamak için elektrolit seviyelerine bakılması gerekir.

**Key Words:** İshal; hipokalemi; ventriküler fibrilasyon; senkop

## ABSTRACT

Diarrheal diseases remain a significant cause of morbidity and mortality in the elderly population. Abnormalities in water homeostasis and decreased thirst perception put elderly patients at higher risk for dehydration, especially in the setting of diarrhea. A 62-year-old female patient was admitted to the emergency department after a syncope attack. She was suffering from nausea and malaise with a history of diarrhea for only one day. She has not any chronic medical disease or medication. Potassium level was 2.6 mmol/L at the blood serum that was taken on admission; potassium replacement was started in the first hour. At the second hour of admission ventricular fibrillation was detected, sinus rhythm was achieved by resuscitation. Patient was hospitalized in coronary intensive care unit; coronary angiography revealed normal coronary vessels with a few plaques, without any significant narrowing. In conclusion, even a simple gastroenteritis could provide a basis for a serious ventricular fibrillation in elderly people. In the elderly patients that have gastroenteritis and presented with symptoms of dehydration and hypotension, blood electrolyte levels should be checked not to miss some of the adverse conditions like acute renal failure and electrolyte imbalance that could develop due to fluid and electrolyte loss.

**Key Words:** Diarrhea; hypokalemia; ventricular fibrillation; syncope

## INTRODUCTION

Diarrheal diseases remain a significant cause of morbidity and mortality in the elderly population because of a weakened immune system, intestinal motility disorders, poor nutritional status and other underlying chronic medical diseases<sup>1</sup>. Abnormalities in water homeostasis and decreased thirst perception put elderly patients at higher risk for dehydration, especially in the setting of diarrhea. Hypokalemia as a result of diarrhea could be seen in vulnerable patients like elderly. Herein, we reported a healthy elderly patient experienced with ventricular fibrillation (VF) because of severe hypokalemia due to diarrhea.

## CASE

A 62-year-old female patient was admitted to the emergency department after a syncope attack with duration of 5 minutes with no micturition or defecation. She was suffering from nausea and malaise with a history of diarrhea for only one day. She didn't complain of chest pain, palpitation and dyspnea. She had not experienced any cardiac disease or cerebrovascular disease. On examination, her blood pressure was 80/40 mmHg, heart rate was 65 beats/min, body temperature was 36.5°C. Cardiac auscultations and neurological examination were normal. There wasn't any significant electrocardiogram (ECG) finding including ST segment changes. On admission, significant laboratory results were as follows; Hgb: 8.7 g/dL (normal range: 13.6-17.2 g/dL), potassium: 2.6 mmol/L (normal range: 3.5-5.1 mmol/L), calcium: 6.3 mg/dL (normal range: 8.9-10.3), magnesium:

## Yazışma adresi

Fatih BUYUKCAM, M.D.  
Dışkapı Yıldırım Beyazıt Eğitim ve Araştırma Hastanesi Acil Tıp Kliniği,  
Ankara  
e-mail: fatihbuyukcam@gmail.com  
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1.93 mg/dL (normal range: 1.6-2.6 mg/dL), phosphorus: 2.4 mg/dL (normal range: 2.5-4.5 mg/dL), troponin-I: 3.22 ng/mL (normal range: <0.04 ng/mL). In the first hour as initial therapy, 10 mEq/h potassium chloride was started to be given intravenously in 500 cc 0,9% NaCl and 100 mg/h calcium gluconate infusion in 100 cc 0,9% NaCl intravenously at the same time.

At the second hour of admission her consciousness was lost. At this time the hearth rhythm was ventricular fibrillation. Normal cardiac rhythm was achieved by the first defibrillation with 300 J by monophasic defibrillator. Patient was hospitalized in coronary intensive care unit. Coronary angiography done to exclude myocardial infarction revealed a few plaques on left anterior descending artery (LAD), right coronary artery (RCA) and circumflex artery (CX) without any significant narrowing. It was assumed that the entire cause of ventricular fibrillation was hypokalemia. After two days of follow up, hypokalemia and hypocalcemia were treated and patient was discharged.

## DISCUSSION

The most common cause of hypokalemia is increased loss of potassium such as gastrointestinal loss. Gastrointestinal loss of potassium

occurs by vomiting, nasogastric suction, diarrhea, malabsorption, ureterosigmoidostomy, enteric fistula and villous adenoma<sup>2</sup>. Kc et al. reported that hypokalemia was seen 64.70% of patients presenting with acute gastroenteritis<sup>3</sup>. The clinical manifestations of hypokalemia usually start when serum concentrations decrease 2.5 mEq/L<sup>2</sup>. Ventricular arrhythmias are among cardiovascular side-effects of hypokalemia<sup>4</sup>.

The elderly and those patients with underlying ischemic heart disease, appear to have the highest risk for hypokalemia-related complications<sup>4</sup>.

We experienced one of the most serious complications of hypokalemia with a potassium level of 2.5 mEq/L and the cause of hypokalemia was diarrhea in our patient. Although malnutrition, some diuretics and antibiotics can cause hypokalemia<sup>5</sup>, the patient wasn't receiving any medication and she didn't tell any history of loss of appetite, so we excluded malnutrition and medication as the cause of hypokalemia.

In conclusion, diarrhea related severe hypokalemia may trigger VF even in a healthy elderly patient. So, physicians should not underestimate electrolyte imbalances in elderly patients presenting with syncope.

**Conflict of interest statement:** None declared.

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