An Unusual Complication following Uroflowmetry: Water Intoxication Resulting in Hyponatremia and Seizure

M.M.	Muta M.	Issa
R.S.	Raj S.	Pruthi
C.	Conrad	Vial
D.E.	Diane E.	McNamara
M.K.	Martha K.	Terris

Emory University School of Medicine, Atlanta, Ga.; Palo Alto Veterans Affairs Health Care System, Palo Alto, Calif, and Stanford University School of Medicine, Stanford, Calif., USA

Key Words

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Abstract

Uroflowmetry is considered a simple and noninvasive test in the evaluation of urinary symptoms. It requires patients to consume fluid orally for a full bladder prior to undertaking the test. Guidelines regarding the amount and rate of oral fluid intake have not been accurately defined. We report on a patient who suffered a serious complication of water intoxication with hyponatremia and seizure due to excessive water consumption and absorption during uroflowmetry. We discuss the underlying factors concerning this complication and recommend a more conservative approach to attain a full bladder in a certain subgroup of patients at risk of developing such a complication.

Muta M. Issa, MD, Emory University School of Medicine, The Emory Clinic (Urology), 1365 Clifton Road, NE, Atlanta, GA 30322 (USA), Tel. +1 404 778 3186, Fax +1 404 869 6091

Introduction

Uroflowmetry is considered a simple and noninvasive test for objective assessment of obstructive voiding symptoms. We report on a patient who developed water intoxication and presented with clinical features of hyponatremia following uroflowmetry.

Case Report

An otherwise healthy 72-year-old man developed obstructive voiding symptoms 6 months following radical retropubic prostatectomy (RRP) for stage T2A prostate cancer. The patient's urinary continence was unaffected by his obstructive symptoms. His past history included partial gastrectomy with Billroth-I diversion for treatment of peptic ulcer disease with no long-term sequelae.

During the course of his urological evaluation, uroflowmetry was scheduled and the patient received standard instructions to present for the test with a full bladder. Uroflowmetry revealed a peak flow rate of 12 ml/s with an obstructive flow pattern. Four hours later, the patient presented to the emergency room with anxiety, generalized weakness and confusion. Shortly after, he suffered a transient clonic seizure. Laboratory evaluation revealed a markedly low level of serum sodium (118 mEq/l), chloride (83

mEq/l), and serum osmolality (252 mosm/kg). His serum potassium, glucose and cardiac enzymes were normal. He was admitted to the intensive care unit where he was treated with fluid restriction, diuretics, and slow intravenous infusion of 3% hypertonic saline. Within 48 h, his serum sodium, chloride and osmolality normalized to 135 mEq/l, 105 mEq/l, and 291 mosm/kg, respectively. The patient's symptoms resolved and he was discharged home. On careful questioning, the patient confirmed drinking in excess of 6 liters of water over a 3-hour period in preparation for his uroflowmetry test. A few days following his discharge, the patient experienced low back pain which he attributed to a fall during the time of his confusion and lethargy. Radiological examination of the thoracolumbar spine revealed a stable compression fracture of the 12th thoracic vertebral body. He was treated conservatively with analgesics and his low back symptoms improved without long-term sequelae.

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Following the patient's recovery from hyponatremia and low back pain, cystoscopic examination confirmed the presence of a vesicourethral anastomotic stricture. He underwent an uncomplicated transurethral incision of the stricture which resolved his obstructive voiding symptoms.

Discussion

This is the first documented case of severe hyponatremia following uroflowmetry. Two previously reported cases have been attributed to iatrogenic polydipsia secondary to patients' misinterpretation of the quantity of fluid following their primary physicians' advice to 'drink plenty' [1]. Although mild hyponatremia may occur in the setting of increased oral fluid intake, it is usually clinically insignificant and remains undetected. In its more severe form, as seen in our patient and in a previous report [1], the clinical manifestations and sequelae of hyponatremia become apparent as the serum sodium drops to below 125 mEq/l [2]. The development of this unusual adverse event in our patient was a result of excessive consumption of water during a short period of time, i.e. water intoxication. Furthermore, the patient's rapid gastric emptying and altered intestinal absorption from his previous partial gastrectomy and diversion played a facilitating role in this situation [3].

Hyponatremia can be prevented by carefully instructing patients regarding the amount of fluid necessary for a full bladder prior to uroflowmetry. A reasonable recommendation is three 8-oz glasses of water (approx. 750 ml spread over a period of 2 h to ensure a more physiological rate of bladder filling. Patients with a previous history of upper gastrointestinal surgery, limited cardiovascular and pulmonary reserve such as a history of congestive cardiac failure, and renal compromise are particularly at higher risk to develop complications from excessive fluid intake. Therefore, further precaution is necessary in these patients to ensure a slower rate of water consumption. In our opinion, these patients should be instructed to maintain their usual oral fluid intake but refrain from voiding prior to their clinic appointment to ensure full bladder.

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