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Sjogren's Syndrome Manifested as Hypokalemic Paralysis

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Abstract

A 31- year old woman was admitted for hypokalemic paralysis. Laboratory examination revealed hyperchloremic metabolic acidosis with a positive urinary anion gap compatible with distal renal tubular acidosis (DRTA). Her sicca symptom, as well as positive autoimmune studies pointed to the underlying cause as a case of Sjogren's syndrome. The complications of DRTA include life threatening hypokalemia, nephrolithiasis, chronic renal failure, growth retardation and osteomalacia. These co-morbidities can be avoided if the diagnosis is made early and life long potassium alkali salt replacement is maintained. (J Intern Med Taiwan 2006; 17: 83-86)

Key Words ：Hypokalemic paralysis, Distal renal tubular acidosis, Sjogren's syndrome

Introduction

Hypokalemia is a commonly encountered medical condition resulting from decreased net intake, shifting into cell or increased net loss. Hyperthyroidism and hyperaldosteronism are two common endocrine conditions most frequently diagnosed in patients presented with hypokalemia. We reported this case to remind our fellow physicians about hypokalemic paralysis due to distal renal tubular acidosis as the presenting symptom of Sjogren's syndrome.

Case Report

A 31- year old female was brought to our emergency room due to weakness of four extremities. Her blood pressure was 120/70 mmHg, heart rate was 80 /min and conscious was clear. Physical examination showed grade 2 muscle power over four limbs. Reflexes and sensation were normal. ECG showed normal sinus rhythm with flat T wave over all leads. Blood tests were normal except for hypokalemia (K=2.4 mmol/L). Past history revealed two similar

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attacks 5 years and 2 years ago. She was diagnosed to have hypokalemic paralysis. The underlying cause was not told to patient. She was given oral potassium supplement for a few weeks but she did not have regular follow up. Patient underwent extracorporeal short wave lithotripsy for bilateral renal stones about 3 years ago.

Endocrine work up for hypokalemia and renal stone were done. Serum magnesium, calcium, phosphate, intact PTH, thyroid function, renin, aldosterone levels were normal. Bone mineral density determination with dual-energy x-ray absorptiometry (DEXA) was -2.33 standard deviation compatible with osteopenia. Arterial blood gas showed metabolic acidosis with serum pH of 7.312, bicarbonate 12.3 mmol/liter (normal value 22-30 mmol/liter). Serum chloride was 116 mmol/liter (normal value 98-108 mmol/liter). The patient thus had a hypokalemic hyperchloremic metabolic acidosis and renal tubular acidosis was suspected. Urine analysis showed a pH of 7.5 and a positive anion gap (urinary sodium 6 mmol/liter+ potassium 12 mmol/liter - chloride 5mmol/liter = +7 mmol/liter). Urinalysis was negative for glucose and protein, Red blood cell in urine was 5-10 /HPF. Serum creatinine level was 1.0 mg/dL. Creatinine clearance was 66.2mL/min. Urinary potassium excretion was 64.68 mmol/day. Urine osmolality was 282 mOsm/Kg. Transtubular potassium concentration gradient was 19.1. Calcium excretion was 420 mg/day. Renal ultrasound showed multiple hyperechoic lesions with post-acoustic shadow compatible with bilateral nephrocalcinosis. A diagnosis of distal renal tubular acidosis (DRTA) with bilateral renal stones was made.

Further work up regarding the underlying cause of RTA was done. Consultation to the ophthalmologist was made because patient suffered from gritty, burning sensation of both eyes. She also noted the accumulation of thick strands in the inner canthi of both eyes in the morning. There was also polyuria and polydypsia. The time of onset of xerostomia and xerophthalmia could not be recalled by our patient. Schirmer's test demonstrated 2mm at 5 minutes. Her eyes were found to have keratitis. Anti-Ro and anti-La antibodies were >600(+) (normal value 7) strongly positive. Anti-nuclear antibody was1:640 speckled and rheumatoid factor 197 IU/ml (normal value 20IU/ml) was also positive. Hepatitis B surface antigen, hepatitis C and double stranded DNA antibodies were negative. She was diagnosed to be a case of Sjogren's syndrome. Patient denied family history of sicca symptoms but her father also suffered from renal stone.

On admission, potassium in saline infusion was given and patient's motor power recovered. Patient was discharged with oral potassium citrate treatment. Artificial eye drop and ointment were given for dry eyes. Her potassium level was maintained in normal range during follow up visits.

Discussion

RTA is a disorder of renal acidification out of proportion to the reduction in glomerular filtration rate. It is characterized by hyperchloremic metabolic acidosis with a normal serum anion gap[1]. DRTA is a disorder of the distal nephron which cannot lower the urine pH normally. The underlying cause is due to the excessive back-diffusion of hydrogen ions from the lumen of the collecting duct to blood or there is inadequate transport of hydrogen ions. DRTA is diagnosed by a normal anion gap metabolic acidosis with a simultaneous urine pH greater than 5.5. Hypokalemia may also occur because urinary concentration and potassium conservation also tend to be impaired[1]. Our patient presented as hypokalemic paralysis with hyperchloremic metabolic acidosis so DRTA was suspected. Our patient also suffered from bilateral renal stones. Patients with renal stones must be screened for RTA. Osther et al. recommended using morning fasting urine pH followed by a short ammonium chloride loading test if urinary pH is above 6.0[2]. The nephrolithiasis in DRTA result from chron-

ic acidosis that lowers renal tubular reabsorption of calcium, causing renal hypercalciuria and mild secondary hyperparathyroidism. Our patient was also found to have hypercalciuria. Her parathyroid hormone level was normal but her bone mineral density study showed osteopenia.

DRTA can be familial with autosomal dominant as the most common form of inheritance[1]. Secondary causes included Sjogren's syndrome, hypergammaglobinemia, chronic active hepatitis or lupus[1]. Although our patient did not reveal evidence of chronic hepatitis or hypergammaglobinemia, her sicca symptoms, positive Schrimer's test and high titers of antibodies to Ro and La were strongly suggestive of Sjogren's syndrome. The pathogenesis of DRTA in Sjogren syndrome is not very clear. Takemoto et al found that patient with Sjogren syndrome with DRTA had high levels of anti-carbonic anhydrase antibodies which affect the function of carbonic anhydrase in cortical collecting ducts[3]. Joo et al showed that the acidification defect was the result of a lack of intact H^+-ATPase pumps in the intercalated cells[4].

Correction of hypokalemia and alkaline replacement are the standard therapy of DRTA. Hypokalemia should be corrected first because alkaline replacement can aggravate hypokalemia resulting in dangerous consequences. Daily life long alkali replacement in a dose of 1-2 mEq/kg prevents acute hypokalemia as well as the chronic complications of osteomalacia and nephrolithiasis[5]. In case of significant proteinuria, rapidly deteriorating renal function or evidence for active glomerulonephritis, a kidney biopsy should be considered before prescribing corticosteroids or other immunosuppressive drugs[6].

Porkorny et al. reported a group of 65 patients with Sjogren syndrome with extraglandular symptoms[7]. Among these 65 patients, the mean age of onset was 41.8 years with 10:1 female predominance. Articular (32 cases), lacrimal (30 cases) and salivary (30 cases) manifestations were the most frequent initial symptoms. Renal involvement was detected in 15 of the 65 patients. Our patient is relatively young at the age of diagnosis. Renal tubular acidosis seemed to be more prominent than exocrinopathy in her clinical presentation.

In conclusion, hypokalemia should be considered in patients presenting with muscular weakness. The cause of hypokalemia should be sought. Although uncommon, DRTA must be included in the differential diagnoses in patients presenting with hypokalemic paralysis and nephrolithiasis[8]. The diagnosis of DRTA is reliably confirmed by the finding of a positive urinary anion gap during metabolic acidosis. Timely treatment will prevent substantial morbidity including renal failure and metabolic bone disease. DRTA may also be the first clue in the identification of an underlying autoimmune disorder, particularly Sjogren's syndrome[9].

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史格蘭氏症候群以低血鉀性癱瘓爲起始表現

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摘 要

一名三十一歲女病患因低血鉀性癱瘓住院。其血液檢查呈高血氯性代謝性酸中毒而尿液檢查則發現有正向之陰離子間隙，診斷爲遠端腎小管性酸血症(distal renal tubular acidosis)。患者也訴說有乾燥症的症狀，進一步作免疫學檢查診斷爲史格蘭氏症候群(Sjogren's syndrome)。遠端性腎小管性酸血症的併發症包括可致命性的低血鉀，腎結石，慢性腎衰竭，生長遲緩及骨質軟化症。早期診斷及長期的鹼性鉀鹽補充可有效的預防上述合併症。