

Case Report

Adult Onset Distal Renal Tubular Acidosis: A Disorder of an Autoimmune Disease

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Abstract

We present the case of 36 yrs old female who presented with acute onset quadriplegia who was subsequently diagnosed to have Sjogrens syndrome with distal RTA with hypothyroidism.

Introduction

Classic distal RTA is due to defects in the basolateral $\text{HCO}_3^-/\text{Cl}^-$ exchanger, or subunits of the H^+ -ATPase. Other examples include an abnormal leak pathway (e.g., amphotericin B)^{1,2} or abnormalities of the H^+K^+ -ATPase. The classic feature of this entity is an inability to acidify the urine maximally (to $\text{pH} < 5.5$) in the face of systemic acidosis.^{1,2}

The pathogenesis of the acidification defect in most patients is evident by the response of the urine Pco_2 to sodium bicarbonate infusion. When normal subjects are given large infusions of sodium bicarbonate to produce a high HCO_3^- excretion, distal nephron H^+ secretion leads to the generation of a high Pco_2 in the renal medulla and urine.³ The magnitude of the urinary Pco_2 (often referred to as the urine minus blood Pco_2 or U - B Pco_2) can be used as an index of distal nephron H^+ secretory capacity.^{4,5} The U - B Pco_2 is generally subnormal in classic hypokalemic distal RTA, with the notable exception of amphotericin B-induced distal RTA, which remains as the most common example of the "gradient" defect

The hallmark of classic hypokalemic distal RTA has been the inability to acidify the urine appropriately during spontaneous or chemically induced metabolic acidosis. Distal RTA occurs frequently in patients with Sjögren's syndrome.⁶ A frank distal tubular acidosis was found in 5% of patients with Sjögren's syndrome.⁶

Sjögren syndrome present with sicca symptoms, such as xerophthalmia, xerostomia, and parotid gland enlargement. Extraglandular features may develop, such as arthralgia, arthritis, Raynauds phenomenon, myalgia, pulmonary disease, gastrointestinal disease, leukopenia, anemia, lymphadenopathy, neuropathy, vasculitis, renal tubular acidosis, and lymphoma. Importantly, classic clinical features of Sjögren syndrome may also be seen in viral infections with HCV, HIV, and HTLV.

Case Report

- 37 yrs, Hindu married, female, presented with history of gradually progressive weakness of bilateral upper and lower limb since 3 days. No history suggestive of higher functions/cranial nerves/bladder/bowel involvement. No history of vomiting, loose motions and fever. No history of high carbohydrate diet intake. On detailed enquiry patient gave h/o dryness of eyes and mouth since last 5 months, no history suggestive of vasculitis or autoimmune diseases

- On examination patient was averagely built, pulse rate was 84/min, regular with blood pressure - 110/70 mmHg. General examination was normal except a classic malar rash (Figure 1) and a postauricular rash. Systemic examination was within normal limits except CNS examination which revealed power : 4/5 in bilateral upper limb; 3/5 in bilateral lower limb. Rest all CNS examination within normal limit. On investigations Hb was 14 gm/dl with normal WBC and platelets count. Fasting blood sugar 102mg/dl, Blood urea nitrogen- 11mg/dl and serum creatinine - 0.7 mg/dl. ESR 60mm at the end of 1hr. serum Na^+ 139 meq/l, serum K^+ 1.7 meq/l, serum Chloride 118 meq/l, urine K^+ 46, serum Ca^{++} 8.6 mg/dl and Mg^{++} 1.8 mg/dl, Anion gap 11.8.

Arterial - blood Gas Analysis

Date	Ph	PCO2	PO2	HCO3	SO2	Na+	K+
17/3/10	7.25	24	99	10.9	99	139	1.7
21/3/10	7.35	34	99	16.4	99	142	4

- Urine analysis showed pH 7, plasma osmolality 287.58 : urine osmolality 685 mOsmol/L, TTKG 32.85, Which suggest renal loss of potassium. As patient had malar rash and history suggestive of Sjogrens syndrome, so Immunological workup was done. RA factor -negative, ANA + 1:100 Speckled pattern: C3 and C4 levels in normal range, anti dsDNA negative, anti RO/SSA positive 4.87, anti La/SSB negative, Thyroid function test was suggestive of hypothyroidism : TSH -8.31 high, T3- 0.8 low, T4- 0.67 low, antimicrosomal antibody + 1:1600 antithyroglobulin antibody + 1:6400. Schirmers test negative. HIV, HBsAg, anti-HCV - Non reactive.
- USG abdomen revealed bilateral simple ovarian cyst, kidneys were normal in size with no evidence of renal calcification; USG thyroid revealed bulky thyroid gland with increased vascularity s/o thyroiditis.
- With findings in favour of Sjogrens syndrome, minor salivary gland biopsy from lower lip was taken. Histopathology (Figure 2) showed focal lymphoid infiltration in the minor salivary gland biopsy which was consistent with Sjogrens syndrome.

Final Diagnosis

Acute onset hypokalemic quadriplegia due to distal RTA secondary to autoimmune disease : Sjogrens syndrome and Hashimoto's thyroiditis.

Management

Patient was started on IV and oral potassium supplements.

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Fig. 1 : Malar rash

Metabolic acidosis was corrected with bicarbonate supplements. Hypokalemia got corrected over a period of 3 days with gradual improvement in limb weakness. Patient was discharged on Tab. sodium bicarbonate [sodamint] and Syrup potassium chloride [kesol], Tab Eltroxin 50µg OD.

Discussion

Sjögren syndrome may occur as isolated exocrine gland involvement, patients may have involvement by a systemic inflammatory disease of the kidneys, lungs, esophagus, thyroid, stomach, and pancreas.⁷⁻¹⁰ Other patients have manifestations of a collagen vascular disease most commonly rheumatoid arthritis, and less frequently SLE, scleroderma, polymyositis, or MCTD. Serologic abnormalities in Sjögren syndrome include hypergammaglobulinemia, rheumatoid factor, cryoglobulins, a homogeneous or speckled pattern ANA, anti-Ro/SSA and anti-La/SSB, but serum complement levels are generally normal unless the patient has associated SLE.

The major clinical renal manifestations of patients with Sjögren syndrome usually relate to tubulointerstitial involvement of the kidneys with tubular defects such as a distal RTA, impaired concentrating ability, hypercalciuria, and less frequently proximal tubular defects.⁷⁻¹² In one recent analysis of over 470 patients with primary Sjögren syndrome observed for a mean of 10 years only 20 patients (4%) developed overt renal disease.¹¹ Ten patients had interstitial nephritis on biopsy, eight patients glomerular lesions, and two both lesions.

In most cases the renal pathology shows prominent tubulointerstitial nephritis with sparing of the glomeruli.⁷⁻¹² In one recent series of biopsied patients with primary Sjögren syndrome, patients had either mesangial proliferative glomerulonephritis or membranoproliferative glomerulonephritis, usually associated with cryoglobulins, on biopsy.¹¹ In other series patients may have associated features of SLE. As in SLE, the spectrum of glomerular involvement ranges from mesangial proliferative¹³ to focal proliferative,¹² diffuse proliferative,^{13,14} and membranous nephropathy. Most patients with severe tubulointerstitial disease and Sjögren syndrome respond to treatment with corticosteroids.^{8,15} Patients with immune complex glomerulonephritis and Sjögren syndrome are generally treated in a similar fashion to those with SLE, and those with vasculitis generally receive cytotoxic therapy similar to other necrotizing vasculitides.⁸

Hypokalemia, Distal Renal Tubular Acidosis and Hashimoto's Thyroiditis

Thyroid hormone increases membrane cell Na+K+ ATPase

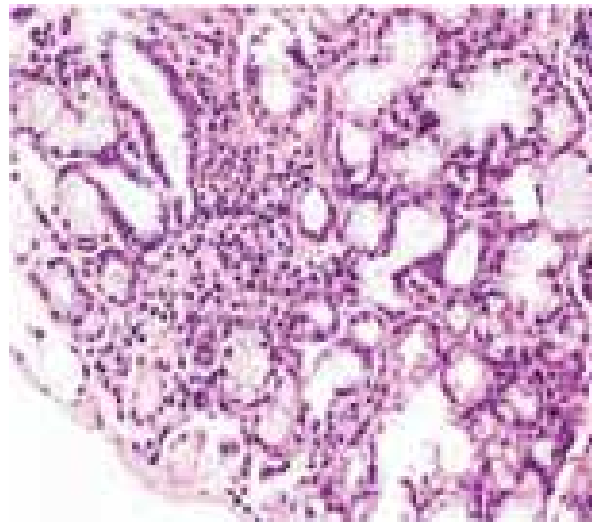


Fig. 2 : Histopathology of lower lip minor salivary gland showing lymphocytic infiltration consistent with sjogren syndrome

pumps. In hypothyroidism, content and function of these pumps are reduced, which causes a decreased elimination of H⁺ ions, exacerbating the acidosis state caused by RTA. Hashimoto's thyroiditis is an autoimmune disease, and distal RTA has also been related to autoimmunity. Antibodies directed against collecting tubule cells could play an outstanding role in this setting, affecting acid base status.

After extensive search of literature we haven't found any case of both Sjogrens and Hashimoto's thyroiditis in same patient presenting with acute onset hypokalemic quadriparesis.¹⁶

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