Case Report

TYPE I RTA WITH AUTOIMMUNE HYPOTHYROIDISM, SHORT STATURE AND ALOPECIA UNIVERSALIS

Authors: G.Deepika[1], Manoj kumar[2], Rajashekar[3],Pavan kumar[4]
[1]Final year postgraduate, Department of Paediatrics, MNR Medical College, Sangareddy
[2]Assistant Professor Department of Paediatrics, MNR Medical College, Sangareddy
[3]Final year postgraduate, Department of Paediatrics, MNR Medical College, Sangareddy
[4]Assistant Professor Department of Paediatrics, MNR Medical College, Sangareddy, Telangana, India
***Corresponding author** Email ID:dpkchakaliya@gmail.com
Date of submission: 16.07.2017; Date of Publication: 5th Sep 2017

ABSTRACT

Type I Renal tubular acidosis is characterized by a normal anion gap non uremic metabolic acidosis due to impaired H+ excretion. We report a rare case of 13 year old girl with type I RTA having overt rickets and nephrocalcinosis ,short stature with metabolic acidosis who also had associated autoimmune hypothyroidism and alopecia universalis.

Keywords: Type I RTA, Rickets, Short stature, Autoimmune hypothyroidism, Alopecia universalis

INTRODUCTION

Renal tubular acidosis is described as disorder of renal acidosis resulting from tubular insufficiency without glomerular insufficiency by Albright et al in 1946.There are four main types. Distal /Classical RTA(type I) is a distinct entity .It is described as clinical syndrome consists of hypokalemia, hyperchloremic metabolic acidosis, inability to lower pH below 5.5 in face of systemic acidosis, nephrolithiasis and nephrocalcinosis[1,2].Bone disease is common, resulting from chronic acidosis and the growth failure is seen with distal RTA in children[2,3]. Concurrence of Distal RTA with several autoimmune diseases like Sjogrens, Rhuematoid arthritis, congenital hypothyroidism[4] have been reported. Here is a such a case with distal RTA with autoimmune hypothyroidism with growth retardation and alopecia universalis.

CASE REPORT

A 13 year old girl presented to OPD with cheif complaints of failure to gain height and knock knee from past few years. Also had complaints of loss of hair all over the body for past one year. Child was apparently normal till 5 years of age and then developed goiter and was diagnosed as hypothyroid with anti thyroid peroxidase antibodies being positive and was put on thyronorm. Then at the age of 6 years she developed knock knee which was gradually progressive associated with difficulty in walking. She was evaluated for knock knees was diagnosed to have type I RTA at the age of 11years and was treated but has a poor treatment compliance. Now child presented to us with complaints of failure to gain height, weight and hair loss all over body. There is no history of fever, vomiting, headache, abdominal pain and decreased urine output. She was born to second degree consanguineous marriage. Other siblings were normal. She did not attain her menarche.

ON EXAMINATION:

She was conscious, alert,thin built and comfortable.She was afebrile, PR-84/min,BP-100/60mmHg,RR-32/min.She has no scalp hair,no eyebrows,no eyelashes and no axillary hair and pubic hair. Has no hair on any part of the body. Thyroid gland was normal in size.SMR staging was pre adolscent stage. She had genu valgus deformity of right leg. Her height was 128cms(<3SD)(Short stature) and weight was 20kgs(<3SD).Her abdomen was soft with no hepatosplenomegaly and there were no other masses.CVS examination was normal. Respiratory system examination showed bilateral equal air entry and vesicular breath sounds.CNS examination was normal. Spine was normal.

Fig1: 13 yr girl with alopecia universalis and genu valgus deformity .

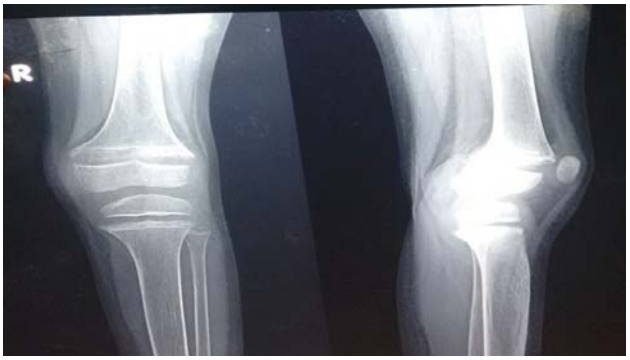

Fig2: x ray right knee showing rickets changes- flaring at lower end of femur and upper end of tibia.

INVESTIGATIONS:

CBP was normal, blood sugar was 84mg/dl,Blood urea(22mg/dl) and serum creatinine(0.4mg/dl) were normal. serum calcium(7.8mg/dl) and phosphorus(2.4mg/dl) were mildly reduced. ABG showed metabolic acidosis without anion gap, hyperchloremia, hypokalemia(2.3meq/L),pH of 7.2,alkaline phosphate of 910 IU/L,PTH levels were normal, VitD levels were normal.USG abdomen showed nephrocalcinosis in past which resolved on treatment, anti TPO antibodies were positive (929 IU/L)and TSH-110 IU/L despite of treatment with thyronorm of 100µg.Skin biopsy taken from back showed alopecia totalis.X-Ray of right knee and wrists had signs of rickets. Urine pH was >7.2.Serum bicarbonate was 12 meq/L.ECG was normal.MRI Brain-normal.

MANAGEMENT:

She was put on thyronorm of 125µg,soda bicarbonate tablets 500mg 2 tablets twice daily,syrup potassium citrate on monitoring levels,calcium,vitD(high dose vit D given),phosphate were supplemented.Treated with topical steroid and topical tacrolimus application for alopecia.On followup her metabolic profile improved but alopecia persisted and is on treatment.

DISCUSSION:

Distal RTA is due to impaired functioning of one or more transporters or proteins involved in acidification process including H+/ATPase, the $HCO3^-/Cl^-$anion exchangers or the components of aldosterone pathway resulting in urine pH that cannot be reduced to less than 5.5 and systemic acidosis. Plasma bicarbonate is frequently less than 15meq/L, and hypokalemia is seen as compensation. Hypercalciuria and decreased citrate excretion are often present resulting in nephrocalcinosis and nephrolithiasis[1,2] .Distal RTA can be inherited or sporadic.

Sporadic cases can be primary or secondary. Inherited forms are caused by autosomal dominant or autosomal recessive mutations. Secondary types result from autoimmune diseases like hypergammaglubolinemia, Sjogren, rheumatoid arthritis, hashimotos thyroiditis[5] and sickle cell anemia, drugs, kidney transplantation, medullary sponge kidney,chronic obstructive uropathy etc. Complications due to distal RTA include nephrocalcinosis, nephrolithiasis, growth retardation as result of chronic acidosis, rickets in children and osteomalacia in adults[2,3].Treatment includes bicarbonate replacement .The base requirement for distal RTAs is generally in range of 2-4meq/kg/24hrs. Monitored for development of hypercalciuria. If symptomatic hypercalciuria, nephrolithiasis, nephrocalcinosis present require thiazide diuretics to decrease calcium excretion. Additional treatment with potassium[6], vitD, phosphate is required with monitoring of their levels.

In this case distal RTA was diagnosed earlier as child had rickets with growth failure and ABG showed metabolic acidosis with hyperchloremia without anion gap.she had normal blood urea,creatinine,normal gfr,low serum bicarbonate levels(12meq/L),urinary pH was alkaline and had nephrocalcinosis.Child has autoimmune Hashimoto's thyoiditis with anti TPO antibodies(929 IU/L) and TSH remained high with value of >100 IU/L inspite of treatment with thyronorm of 100µg/l.Alopecia in association with rickets arouse a suspiscion of vitamin D dependant rickets but as PTH levels,1,25 D levels were always normal ,no response to high dose vit D , as there was metabolic acidosis and nephrocalcinosis we ruled out possibility of Vitamin D dependant rickets type II .There are several cases reported showing alopecia associated with autoimmune hypothyroidism suggesting the cause for alopecia in this case could be autoimmune hypothyroidism[7,8] .Genetic analysis of vit D receptor is not available at our centre. Mechanism of growth failure in acidosis related to dysfunction of growth harmone/insulin like growth factor. Growth failure in this case could be due to chronic acidosis and also due to autoimmune hypothyroidism. Family history of consanguinity suggests autosomal recessive inheritance as other children are normal.

CONCLUSION:

Distal RTA has clinical syndrome like presentation with rickets, growth failure, nephrocalcinosis, acidosis and found sometimes in association with autoimmune conditions. It is important to differentiate type of RTA and treat RTA as treatment leads to improvement in growth, metabolic derangements and to correct the signs of rickets.

REFERENCES

1. Basak RC,Sharkawi KM,Rahman MM,Swar MM (2011) 'Distal renal tubular acidosis,hypokalemic paralysis, nephroclcinosis, primary hypothyroidism, growth retardation', Omen Med J, July(26(4)), 271-274.
2. Kiran BV,Barman H,Iyengar A (2014) 'Clinical profile and outcome of renal tubular disorers in children:single centre experience', Indian J Nephrol, Nov(24(6)), 362-6.
3. Lee JH,Park JH,Ha TS,Han HS (2013) 'Refractory rickets caused by mild distal renal tubular acidosis', Ann Pediatr Endocrinol Metab, Sep(18(3)), 152-5.
   4.Mason A.M,Golding PL (1970) 'Renal tubular acidosis and autoimmune thyroid disease', Lancet, Nov(2(7683)), 1104-7.
4. Punekar SA,Korivi D,Pandey D,Pednekar SJ,Deshpande S (2012) 'Adult onset distal renal tubular acidosis:Disorder of an autoimmune disease', J Assoc Physicians India, Oct(60), 58-60.
5. Preminger GM,Sakhee.K,Skurla C,Pak CY (1985) 'Prevention of recurrent calcium stone formation with pottasium citrate therapy in patients with distal RTA', J Urol, July(134(1)), 20-3
6. Bakry OA,Basha MA,EL Shafiee MK (2014) 'Thyroid disorders associated with alopecia areata in eygptian patients', Indian J Dermatol , Jan(59(1)), 49-55
7. Radetti G (2014) 'Clinical aspects of hashimoto's thyroiditis', Endocr Dev, Aug(26), 158-70