

Case Presentation

Fabry's Disease: A Case series report of a Libyan family

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Abstract:

Introduction Fabry's disease (FD) is a rare disorders due to the very low residual function of alphagalactosidase enzyme causing chronic kidney disease (CKD), with the incidence of 1/40,000 males. Heterozygous females may be asymptomatic. We hereby report a patient having CKD and other clinical findings like, dermatological, neurological and cardiological manifestations and pedigree analysis were strongly suggest the diagnosis of Fabry Disease.

Case Presentation: A 40 year old man with high renal profile The patient is normotensive, non-diabetic, in 2013 had history of left ophthalmolopgia which resulted from acute ischemia in midbrain, In 2014 had bilateral sensory neural hearing loss. In 2019 was noticed that he had a skin rash in a "bathing-trunk" distribution, they are small angiomas, by physical examination patient looks pale, he has mild pedal edema, CNS examination showed 7th, 8th and 9th cranial nerve palsy, his investigations showed raised s. creatinine 3.2 mg/dl, Urine protein++, eGFR 22.4/min/1.73m². Ultrasound abdomen showed small kidneys and echocardiography showed LVH. A pedigree analysis showed recipient was third in birth order and has two brothers a known case of CKD on regular hemodialysis, The CKD of the brothers was a result of Fabry Disease, was evaluated for a-galactosidase activity which was found markedly decreased (12.10; normal enzyme activity level >60). According to clinical manifestations and strong family history of FD,

Conclusion & Recommendations: This case report highlights the importance of careful evaluation of cases of CKD due to unusual causes, particularly when there's positive family history, in order to avoid misdiagnosis and also for early and proper therapy.

Key words: Fabry's Disease, a-galactosidase, chronic kidney disease, Enzyme Replacement Therapy.

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Introduction

Fabry's disease (FD) is one of those rare disorders which are highly undiagnosed. The reported incidence of this disorder is 1/40,000 males.[1] FD being a rare cause of end-stage renal disease (ESRD), accounts for 0.0167% of all causes of ESRD.[2] Manifestations of FD are often more severe in men due to the very low residual function of alpha-galactosidase. Heterozygous females may be asymptomatic except for corneal opacities or depending on lyonization or random X-inactivation, they may be as severely affected as homozygous males.[3]

Case Presentation:

A 40 year old man referred to our nephrology clinic with history of generalized fatigue associated with high renal profile.

The patient historically normotensive, non-diabetic, but in 2013 had history of leftophthalmolopia which resulted from acute ischemia in midbrain.



We hereby report a patient having CKD, and had other clinical findings such as dermatological, neurological and cardiological manifestations and pedigree analysis were strongly suggest the diagnosis of Fabry Disease.

This case report highlights the importance of careful evaluation of cases of CKD due to unusual causes, particularly when there's positive family history, in order to avoid misdiagnosis and also for early and proper therapy.

In 2014 started follow up at ENT clinic because he has bilateral sensory neural hearing loss. In 2019 it was noticed that he had a skin rash in a "bathing-trunk" distribution. They are small angiomas, probably angiokeratomas. fig1.

fig1. Angiokeratoma

On physical examination patient looks pale, he has mild bilateral mild pedal edema, vital signs within normal range, CNS examination shows 7th, 8th and 9th cranial nerve palsy.

Tab.1 At this time his blood tests were as follows:-

Sodium	135mmol/L
Potassium	4mmol/L
Bicarbonate	16mmol/L
Urea	80mg/dl
Creatinine	3.2mg/dl
Urineprotein	++
Haemoglobin	10g/dl
Normalwhitebloodcells	
PTH	94pg/ml
HBA1C	5.8%
eGFR	22.4/min/1.73m2

Ultrasound examination of the abdominal cavity showed that the liver, biliary system, spleen, bladder and prostate appeared to be normal, with no ascites and nolympadenopathy. His kidneys appeared to be somewhat small (with a bipolar diameter of 8.0cm) and in crease in echogenicity.

An electrocardiogram showed lateral T-wave inversion and left ventricular hypertrophy. and echocardiography showed LVH, moderate Aortic regurgitation with EF 65%.

A pedigree analysis showed recipient was third in birth order and has two brothers a known history of ESKD on regular

Discussion

Our case series is important because of following reasons FD is under-diagnosed and screening of high-risk groups is important for case finding and (2) this case report highlights the importance of screening

hemodialysis, the first one on hemodialysis since 2011 and the other since 2013. the ESKD of the brothers was a result of Fabry Disease, was evaluated for alpha-galactosidase activity which was found markedly decreased (12.10; normal enzyme activity level >60), and was diagnosed as FD with renal failure.

According to clinical manifestations and strong family history of FD we suggest the most likely cause of the CKD in this case is Fabry Disease and our planning is for biochemical investigation of alpha-galactosidase activity. And ERT.

those patients for CKD who have unexplained renal failure.

Fabry nephropathy is one of the most severe manifestations of FD. It had been one of the unknown causes of morbidity and

mortality before the widespread availability of dialysis and kidney transplantation. Like most aspects of FD, kidney disease is thought to result from GL-3 accumulation in glomerular endothelial, mesangial and interstitial cells, podocytes, and renal vasculature. Progressive intracellular accumulation of GL-3 is thought to cause glomerulosclerosis and interstitial fibrosis [8] as well as its urinary excretion together with other lipids. [9]

Diagnosis may be presumptive based on observation of symptoms and laboratory findings with family history and medical pedigree. Definitive diagnosis is made by enzyme assay and gene mutation analysis or linkage analysis.

Conclusion

Fabry's disease being a rare cause of chronic kidney disease, more severe in men due to the very low residual function of α -galactosidase.

CKD, dermatological, neurological, cardiological manifestations and pedigree analysis strongly suggest the diagnosis of Fabry Disease.

References:

1. McGovern MM, Desnick RJ. Lysosomal storage diseases. Cecil Textbook of Medicine. In: Goldman L, editor. 21st ed. St. Louis: W.B. Saunders Company; 2000. pp. 1104–7. [Google Scholar]
2. Thadhani R, Wolf M, West ML, Tonelli M, Ruthazer R, Pastores GM, et al. Patients with Fabry disease on dialysis in the United States. *Kidney Int.* 2002;61:249–55. [PubMed] [Google Scholar]
3. Brady RO, Grabowski GA, Thadhani R. United states: Gardiner-Caldwell SynerMed; 2001. Fabry Disease: Review and New Perspectives; pp. 1–8. [Google Scholar]
4. Ojo A, Meier-Kriesche HU, Friedman G, Hanson J, Cibrik D, Leichtman A, et al. Excellent outcome of renal transplantation in patients with Fabry's disease.

Treatment includes ERT and RRT in the form of dialysis or kidney transplantation. The use of ARBs has been shown to be nephro-protective in other protein uric renal diseases, and could thus be important in FD as well. [13]

Kidney Disease Improving Global Outcomes guidelines suggest that in patients with CKD Stages 3–5, Vitamin D deficiency be corrected. Vitamin D can

reduce proteinuria or albuminuria. [14] Newer modalities under research include gene therapy substrate deprivation. Studies on ERT of FD patients on dialysis are warranted, as this may be the only hope as these patients have to improve survival on dialysis.

Definitive diagnosis is made by enzyme assay and gene mutation analysis or linkage analysis.

Enzyme Replacement Therapy and Renal Replacement Therapy in the form of dialysis or kidney transplantation treatment option. Newer modalities under research include gene therapy.

- Transplantation.2000;69:2337–
- 9.[PubMed][GoogleScholar]
5. Obrador GT, Ojo A, Thadhani R. End-stage renal disease in patients with Fabry disease. *J Am Soc Nephrol*.2002;13(Suppl1):S144–
- 6.[PubMed][GoogleScholar]
6. Tsakiris D, Simpson HK, Jones EH, Briggs JD, Elinder CG, Mendel S, et al. Report on management of renal failure in Europe, XXVI, 1995. Rare diseases in renal replacement therapy in the ERA-EDTA Registry. *Nephrol Dial Transplant*. 1996;11(Suppl 1):4–20. [PubMed][GoogleScholar]
7. Tahir H, Jackson LL, Warnock DG. Antiproteinuric therapy and fabry nephropathy: Sustained reduction of proteinuria in patients receiving enzyme replacement therapy with agalsidase-beta. *J Am Soc Nephrol*.2007;18:2609–17. [PubMed][GoogleScholar]
8. Alroy J, Sabnis S, Kopp JB. Renal pathology in Fabry disease. *J Am Soc Nephrol*. 2002;13(Suppl1):S134–8. [PubMed][GoogleScholar]
10. Branton MH, Schiffmann R, Sabnis SG, Murray GJ, Quirk JM, Altarescu G, et al. Natural history of Fabry renal disease: Influence of alpha-galactosidase A activity and genetic mutations on clinical course. *Medicine (Baltimore)* 2002;81:122–38. [PubMed][GoogleScholar]
11. Batista EC, Carvalho LR, Casarini DE, Carmona AK, dos Santos EL, da Silva ED, et al. ACE activity is modulated by the enzyme alpha-galactosidase A. *J Mol Med (Berl)* 2011;89:65–74.[PubMed][GoogleScholar]
12. Kidney Disease: Improving Global Outcomes (KDIGO) CKD-MBD Work Group. KDIGO clinical practice guideline for the diagnosis, evaluation, prevention, and treatment of Chronic Kidney Disease-Mineral and Bone Disorder (CKD-MBD) *Kidney Int Suppl*. 2009;76:S1–130. [PubMed][GoogleScholar]