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CASE REPORT PEER REVIEWED | OPEN ACCESS

A rare presentation of end stage kidney disease in a 15-year-old girl: A case report

Nneka Chioma Okoronkwo, Olufunmi Adebimpe Ijeoma Otuka

ABSTRACT

Introduction: Chronic kidney disease (CKD) among children is on the rise, both locally and globally. The burden of managing CKD in children from resource-poor centers and the developing nations as a whole is quite challenging. Pediatric CKD has remained a death sentence in many poor nations of the world, including Nigeria. Chronic kidney disease is asymptomatic in its earliest stages, although urinalysis findings or blood pressure may be abnormal. As CKD progresses to more advanced stages, signs and symptoms greatly increase, making the diagnosis of CKD more obvious.

Case Report: We hereby report a rare presentation of only headache, sudden blindness, hypertension, and retinal detachment as the only pointer to end stage kidney disease (ESKD) in a 15-year-old girl.

Conclusion: There is need for nephro-prevention in children, and a higher index of suspicion for CKD, with the intention of reducing or halting disease progression at earlier stages of the disease.

Keywords: Case report, Children, CKD, ESKD

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INTRODUCTION

Chronic kidney disease (CKD) among children is on the rise. It is a state of progressive loss of kidney function ultimately resulting in the need for renal replacement therapy [1, 2]. Chronic kidney disease is defined as the presence of kidney damage or an estimated glomerular filtration rate (eGFR) less than 60 mL/min per 1.73 m^2, persisting for three months or more [1, 2]. Pediatric CKD has remained a death sentence in many poor nations of the world, including Nigeria. This is because the burden of its management in the developing nations is quite challenging.

Chronic kidney disease is asymptomatic in its earliest stages (stage I and stage II), although urinalysis findings or blood pressure may be abnormal [3]. As CKD progresses to more advanced stages, signs and symptoms greatly increase, making the diagnosis of CKD more obvious.

Symptoms and signs at earlier stages of CKD are commonly detected by routine blood or urine testing.

Some common symptoms at later stages of CKD include: Nausea, vomiting, loss of appetite, fatigue and weakness, sleep disturbance, oliguria, decreased mental sharpness, muscle twitches and cramps, swelling of feet and ankles, persistent pruritus, chest pain due to uremic pericarditis, shortness of breath due to pulmonary edema from fluid overload, hypertension that's difficult to control [1–3]. Others are nocturia, flank pain, hyperkalemia, metabolic acidosis, anemia, bone disease (renal osteodystrophy) and cardiovascular disease [1–3].

Patients may report metallic taste, unintentional weight loss, and changes in mental status [1–4].

Physical examination is often not helpful, but patients may have skin pigmentation, scratch marks from pruritus, pericardial friction rub due to uremic pericarditis, uremic frost [where high levels of blood urea Nitrogen (BUN) result in urea in sweat], and hypertensive fundal changes suggesting chronicity [1, 2].

Because most patients at early stages (stage I and stage II) of CKD are asymptomatic, the need for renal screening to detect early disease cannot be overemphasized. Early detection will reduce the morbidity and mortality associated with CKD in children. The National Kidney Foundation has developed a kidney profile test that includes measuring both serum creatinine for estimating GFR and urine albumin-creatinine ratio (ACR) [1, 2, 5–8].

It is an established fact that symptoms of renal disease are common by the time a patient enters CKD stage 4 or 5 [1–3, 5]. Chronic kidney disease can be a devastating illness with many long-term consequences. Most of the complications of CKD have consequences on the patients' health well before kidney function is irreversibly lost, thereby buttressing the fact that symptoms of the disease are common and obvious at late stages of the disease [9].

It is, therefore, rare for a child to present with CKD 5 without common symptoms [1–4] traceable to chronic kidney disease.

We hereby report a rare presentation of only headache, sudden blindness, and retinal detachment in a 15-year-old girl with end stage kidney disease (ESKD).

CASE REPORT

O.C. is a 15-year-old senior secondary school girl who presented to us with complaints of recurrent headache of one month and sudden blindness of five days, all prior to presentation.

Headache was intermittent, generalized, throbbing, initially mild, but became severe five days prior to presentation. It was associated with occasional blurring of vision and vomiting. There was no fever.

The complete loss of vision was sudden. It occurred first in the right eye, and some hours later in the left eye. It was associated with severe pain on both eyes.

There was a history of mild reduction in urinary output and frequency that started about a month prior to presentation. No facial nor leg swelling. No dysuria. No macroscopic hematuria nor change in color of urine. She rather noticed progressive paleness on her face and hands. No history of mercury containing soap or cosmetics.

At onset of headache, she took medications for malaria and typhoid, which the mother bought over the counter. Her symptoms subsided, and re-surfaced some days later. She then took herbal concoctions for a week, without any clinical improvement. Thereafter, she continued with 2 tablets of paracetamol whenever the headache became severe. She took this tablet 1–2 times daily, depending on the frequency and severity of the headache. She did not access medical care early due to financial constraints.

It was the sudden blindness that made her come to the teaching hospital. There was no other significant finding in the review of systems, past medical and surgical history. She had no known drug allergies. Her genotype was AA. Her mother is a single parent with primary level of education, with no job. The patient was the first of two siblings. All of them live in a one room apartment with patient's grandmother, whom they depend on for living. There was no family history of kidney diseases.

Significant clinical examination findings

On presentation, she was fairly ill-looking, afebrile (T=36.8°C), severely pale, no edema, not dehydrated, not dyspneic. Her was 52 kg, height 165 cm, respiratory rate was 28 cycles/min, heart rate was 108 beats/min, blood pressure (BP) was 220/140 mmHg (supine).

Systemic examination findings were normal but for hypertension (HBP) and obvious blindness with bilateral unreactive pupils.

There was no abdominal tenderness nor organomegaly. Kidneys were not ballotable, and there was no ascites. She had normal female genital with tanner stage 3 level of sexual development.

Management

She was immediately given sublingual Nifedipine, 20 mg stat, and admitted into the children's emergency room.

Urinalysis, random blood sugar, S/E/U/C, lipid profile, retroviral screen, complete blood count, and abdominal USS were ordered.

Urine output was 1 mL/kg/h.

Ophthalmological examination revealed leukocoria (Figure 1), and subconjuctival hemorrhage on the right eye (Figure 2). There was no hemorrhage on the left eye.

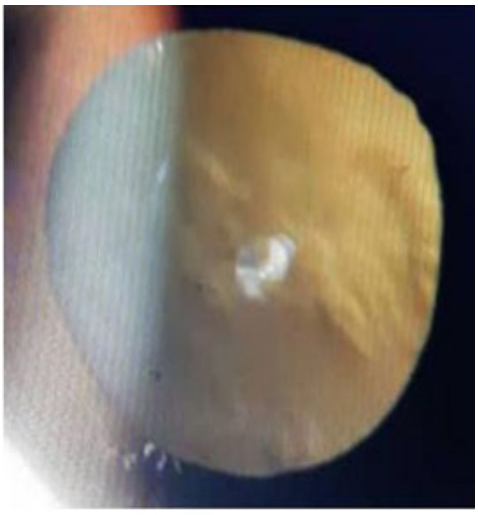

Figure 1: Leukocoria from retinal detachment.

Figure 2: Right eye subconjunctival hemorrhage.

Significant investigation results

- **Urinalysis**: Protein 3+, RBC 3+, PH: 6.0, SG: 1020. Other parameters were negative.
- **S/E/U/CR**: Urea: 40.7 mmol/L (2.4–8.4), Creatinine: 1084 µmol/L (55–106), K+: 6.7 mm/L (3.4–5.2), CL: 91 mmol/L (96–107), Na: 133 mmol/L (135–145), Bicarbonate: 14 mmol/L (24–30).
- **Packed cell volume** = 21% (Hb = 7 g/dL), WBC = 12 × 10^9/L (4–11), (Neutrophils = 60%, Lymphocytes = 40%)
- **Random blood sugar**: 7 mmol/L, **RVS**: Negative to HIV.
- **Abdominal USS**: Revealed small sized kidneys (Right = 8.61×3.4 cm, Left = 8.31×4.28 cm), complete loss of cortico-medullary differentiation, with grade 3 increase in renal parenchymal echoes (Figure 3).
- **Ocular USS**: Showed bilateral retinal detachment with left-sided vitreous degeneration (Figures 4 and 5).

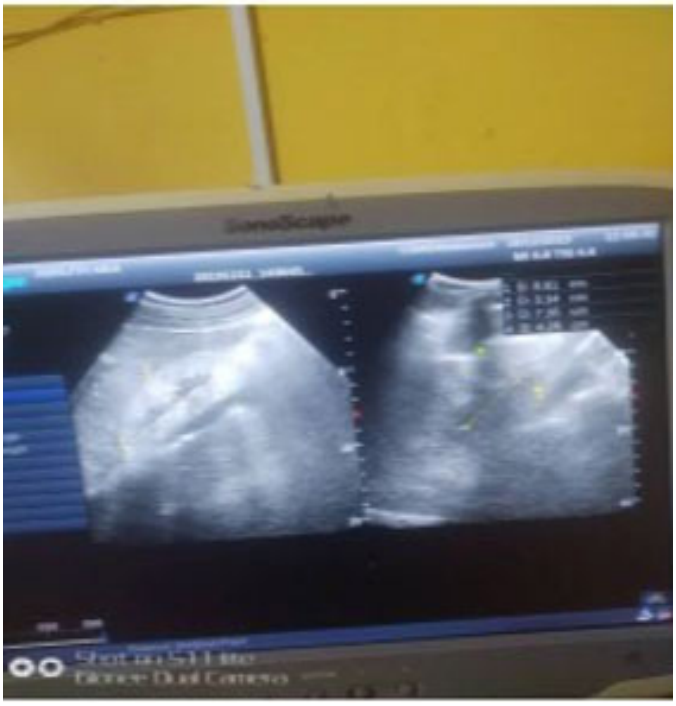

Figure 3: Bilateral small echogenic kidneys.

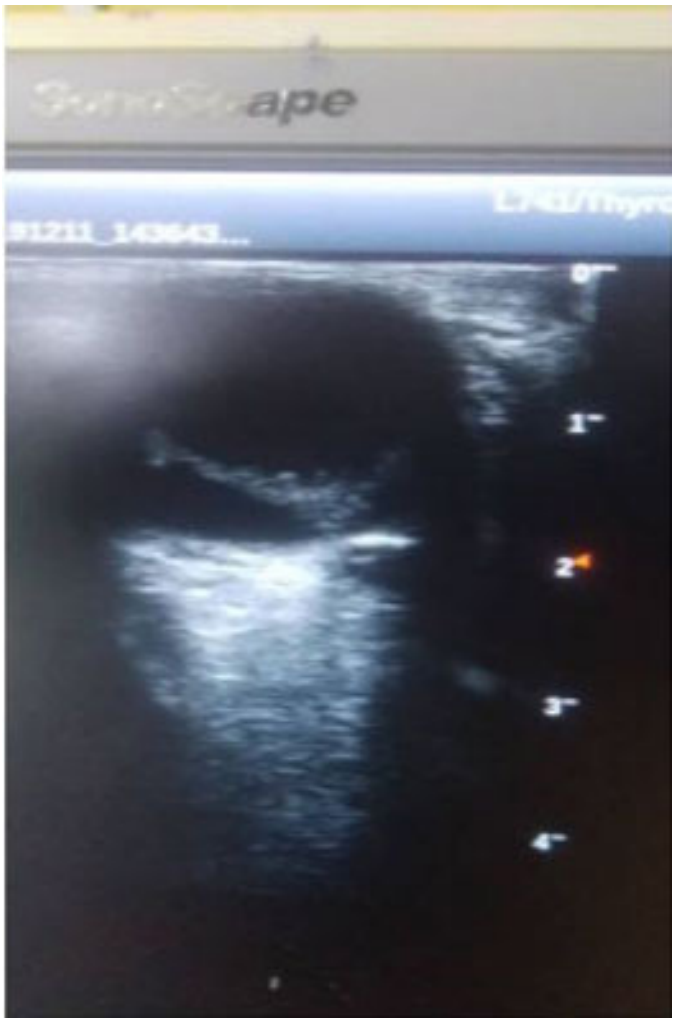

Figure 4: B-mode ocular USS of the left eye showing retinal detachment.

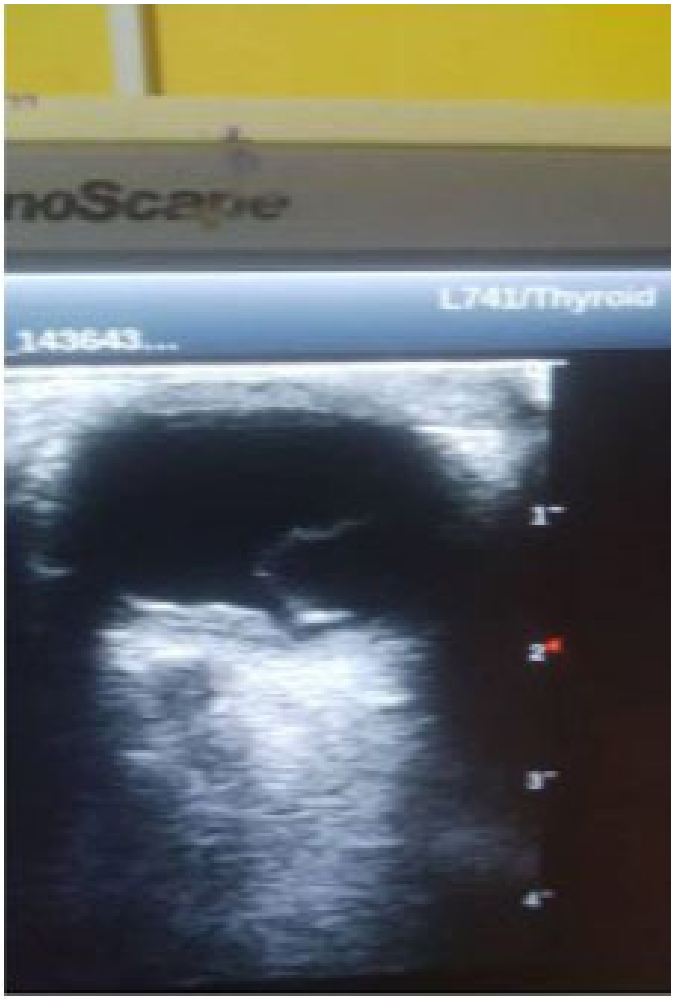

Figure 5: B-mode ocular USS of the right eye showing retinal detachment.

Diagnosis/treatment

The diagnosis made was ESKD with severe HBP and retinal detachment. Hemodialysis (HD) and other standard management protocols for ESKD were commenced immediately. She also received intradialytic blood transfusions. For the HBP, she was immediately given sublingual nifedipine, followed by tab Amlodipine (10 mg daily) and tab Lisinopril (10 mg daily). Her BP and S/E/U/C gradually normalized within two weeks. She was discharged after six weeks, on three times per week HD.

The ophthalmologist could not do much for the bilateral retinal detachment. However, she was given topical 0.005% latanoprost, 0.5% timolol, 0.1% brimonidine, 0.1% diclofenac, vitreolent (0.3% potassium iodide and 0.3% sodium iodide), and 0.1% flurometholone. She remained blind on both eyes till discharge. However, on her first follow-up visit, she had regained some vision on the left eye.

DISCUSSION

Patient's symptoms started a month prior to presentation. She was apparently well until then. It is rare for ESKD to remain asymptomatic for so long! As CKD progresses to more advanced stages, signs and symptoms greatly increase [1–3]. Surprisingly, the index patient had paucity of symptoms traceable to CKD. The absence of edema all the way was a paradox. Edema is a known common manifestation of renal diseases [1–3, 10, 11].

This case re-emphasizes the need for regular nephro-screening exercises among "apparently well school children." This cohort of children with asymptomatic renal diseases will benefit from regular BP checks and urinalysis screening exercises among school children [12–15]. Blood pressure checks should be done on all patients, not only at the renal units of our departments.

Chronic kidney disease is asymptomatic in its earliest stages (stage I and stage II), but urinalysis findings or blood pressure may be abnormal [3]. The index patient had never checked her BP in the past, nor ever did a urinalysis until she presented to our facility. She had no medical records anywhere. Previous BP checks and simple urinalysis would have helped in early detection of her disease. Early detection of renal disease will lead to early intervention, with possible halting of progression to CKD.

It was obvious that the recurrent headache was because of hypertension, and probably uremia. The retinal detachment was most likely due to the severe HBP.

Whether it was the HBP that caused the ESKD, or the ESKD that caused the HBP could not be ascertained at the point of patient presentation to the hospital. Systemic hypertension is one of the main causes of ESKD worldwide [1] and HBP is also a well-known complication of CKD [1–4, 16, 17].

Because of financial constraints, the index patient received treatments in the past by buying medications over the counter from patent medicine dealers. All through the one month of persistent headache, she could not come to the hospital because of poverty. It was the sudden blindness that caused her mother to borrow money from neighbors to bring her to our health facility. Poverty has been shown to be a great risk factor for CKD [17]. Access to early good health care would have detected the early onset of renal disease and HBP in this patient, but for financial constraints.

The index patient presented with severe hypertension, and was given sublingual nifedipine, and later, oral amlodipine and lisinopril [18–20]. Management of severe hypertension in patients with ESKD is very important in determining outcome, amidst other compounding variables of the illness [19, 20].

The ophthalmologists concluded that the retinal detachment was irreversible, although they slated the patient on a weekly eye review for the first month, while she continued her topical eye medications.

CONCLUSION

There should be a higher index of suspicion for CKD, with extra efforts geared toward nephron-prevention especially among children in the developing nations. Headache should be categorized as a common symptom of CKD among older children. Absence of edema does not rule out CKD.

LIMITATIONS OF THE STUDY

This study was limited by the following

1. There were extreme financial constraints on the side of the patient and her family. The money for the investigations and medications was donated by kindhearted staff among the management team.
2. A more detailed examination of the fundus and fundal photographs of the retinal detachment, e.g., optical coherence tomography and fundal photograph were not done due to lack of funds.
3. The patient was not compliant with both treatment and follow-up, despite good counseling.

RECOMMENDATION

The importance of urinalysis and subsequent referral for patients with deranged results should be taught to all grassroot health workers, including patent medicine dealers. This is because many patients will still patronize them in the face of harsh global economy.

Regular nephro-preventive screening exercises like BP checks and urinalysis should be routinely carried out among school children. This will help to detect renal disease at its earliest stages, with the intention of reducing or halting disease progression.

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Author Contributions

Nneka Chioma Okoronkwo – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Olufunmi Adebimpe Ijeoma Otuka – Conception of the work, Acquisition of data, Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Guarantor of Submission

The corresponding author is the guarantor of submission.

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Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

ABOUT THE AUTHORS

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