INTRODUCTION

The symptoms of red urine, milky urine, or milkshake urine can pose a diagnostic dilemma. The common causes include milder local bacterial infections at one end of the spectrum to grave systemic diseases at the other. Malignancies, various nephropathies, and tuberculosis are common causes. Among the parasitic causes, filariasis has been reported in the form of a few small case series and case reports. A diagnosis of filarial chylohematuria without features of lymphatic filariasis can be difficult to make due to the absence of microfilaria in the urine in the majority of cases. This is even more difficult when the patient presents with gross or microscopic hematuria without chyluria. Apart from endemic areas such as India, filariasis does occur in different parts of the world. We report a rare case of hematuria with the presence of Wuchereria bancrofti microfilariae in the urine and review the literature in the context of presentations with chyluria and hematuria.

CASE REPORT

An elderly woman from Bihar in India presented to the urology outdoor at a Tertiary Care Hospital (SGPGIMS, Lucknow) in Northern India, with hematuria with or without clots for 1 week. She also had intermittent episodes of fever with chills and rigors during the past 1 year. She had been treated with antipyretics, antimalarials, and anti-allergic drugs. She remained afebrile for the next 3 months. During this period, she had a history of passing milky urine on three occasions. The last episode occurred about a fortnight before her presenting to us.

KEY WORDS

Chyluria, hematuria, microfilaria, Wuchereria bancrofti

ABSTRACT

There are few reports of “microfilaria in the urine.” We report an elderly woman with gross hematuria who was being investigated for urinary tract tuberculosis. Three consecutive urine samples showed microfilaria of Wuchereria bancrofti. However, she did not have chyluria. Treatment with diethylcarbamazine cleared up the hematuria within 3 days. Chyluria, hematuria, and hematoochyluria are problems of Bancroftian filariasis reported worldwide. The literature review was made to present a simplified way for management.

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A similar episode had occurred 30 years ago. At that time, no specific diagnosis could be made. She apparently responded to some treatment for 6 months, the details of which were not available.

There was no definite history of tuberculosis, flank pain, or trauma to the abdomen. Except for marked pallor, the physical examination revealed no untoward finding. There was no peripheral lymphadenopathy.

She was admitted to the urology ward with a clinical diagnosis of urinary tract tuberculosis.

Her hemoglobin was 6.4 g/dl, platelet count 350,000/cu mm, and total leukocyte count 8000/cu mm with 18% eosinophils on the differential count. The blood sugar, serum electrolytes, and renal function tests were within normal limit. The serum albumin was 2.1 g/dl and the rest of the liver function tests were normal. The chest X-ray was unremarkable.

Three consecutive voided urine specimens were sent to the microbiology laboratory for Ziehl–Neelsen (ZN) staining. On microscopic examination, the smear was teeming with sheathed microfilaria, the distinguishing features of which were well seen on a Giemsa stain [Figure 1]. The well-stained discrete column of nuclei, which did not extend into the terminal zone and the distinct, unstained area of sheath led to the positive identification of the microfilaria as those of *W. bancrofti*. Microscopic examination of the urine revealed plenty of red blood cells (RBCs) and a few pus cells while cytological examination showed microfilariae along with urothelial cells and neutrophils. No malignant cells were seen. The urine culture was sterile. The tests for chyle in the urine also tested positive for *W. bancrofti* antigen (Ag) with a commercially available rapid immunochromatography test (NOW® FILARIASIS, Binax, Inc., USA) [Figure 2].

She was treated with diethylcarbamazine citrate (DEC) with 100 mg three times a day for 3 weeks, chlorpheniramine maleate 25 mg two times a day for 1 week, and levofloxacin 500 mg once a day for 1 week. She was also given 4 units of blood transfusion for her anemia. Within 3 days of starting treatment, the urine had cleared up and the patient became asymptomatic. She did not have a recurrence of hematuria over the next 3 months. Informed consent was obtained from the patient for reporting the case in medical literature.

**DISCUSSION**

Lymphatic filariasis is a mosquito-borne parasitic disease occurring in tropical and subtropical areas and is widespread in India. Of the 128 million infected individuals worldwide, India accounts for 48 million. The heavily infected areas in India are Uttar Pradesh, Bihar, Jharkhand, Andhra Pradesh, Orissa, Tamil Nadu, Kerala, and Gujarat. The majority of cases of filariasis are caused by *W. Bancrofti*.[10,11]

The acute features of lymphatic filariasis consist of systemic reactions, lymphangitis, and adenitis. The pathogenesis of chronic filariasis involves obstruction...
of lymphatic vessels by adult worms caused by the host and parasite-induced inflammatory processes. The chronic features include hydrocoele, lymphatic varices, and elephantiasis.\(^{[12]}\)

Filaria can have varied manifestations, but tropical pulmonary eosinophilia and chyluria are unusual manifestations reported mainly from South Asian countries.\(^{[13]}\) The diagnosis of extralympathic filariasis is difficult because of the nonspecific presentations. Extralympathic filariasis is caused by microfilaria in contrast to the adult form of lymphatic filariasis. The undefined parasite stages or immune complexes are responsible for the heterogeneous pathogenesis and clinical manifestations. The renal involvement in filariasis includes glomerulonephritis, hematuria, and proteinuria and is associated mainly with microfilaremia.\(^{[14]}\)

Chyluria is one of the late manifestations of filariasis and has been reported to occur 1 month to 54 years (average 20 years) after the acute filarial infestation.\(^{[15]}\) Chyluria occurs because of rupture of lymph vessels as a result of retrograde lymphatic hypertension and dilatation in the urinary tract. It is usually associated with abnormal retrograde or collateral flow of lymph from intestinal lymphatics into the lymphatics of the kidney, ureter, or bladder. Chyluria occurs only in 2% of filarial affected patients in the filarial belt.\(^{[15]}\)

Gross hematuria may occur in patients with filarial chyluria which may be associated with findings such as ulceration, congestion, and granulomatous reaction.\(^{[12,16]}\) Hematuria can occur without being associated with chyluria.\(^{[5,9]}\) However, a careful history taking may elicit chyluria in the past.

The mechanism of hematuria in lymphatic filariasis is unclear. It may be related to presumed venolymphatic fistulae and increased pressure in the lymphatic vessels.\(^{[9]}\)

Only a few reports of gross chylohematuria due to filariasis have been reported in literature, and in most cases, microfilariae were detected only in peripheral blood smears rather than in the urine.\(^{[5,12,15,17]}\) Microfilaria positivity in urine has been reported to vary from 40% to 75%. Detection of microfilaria in the urine of patients with hematuria but without chyluria is rare.\(^{[5,14,18]}\)

The diagnosis depends mainly on a careful history, a high index of suspicion, a careful physical examination to look for lymphadenopathy, lymphangitis, and swelling of the extremities.\(^{[12]}\)

Diagnostic investigations for chylohematuria include: (i) urine examination for chylomicroons, triglycerides, fat cells, and/or RBCs, (ii) ultrasound and CT scan of the thorax, abdomen, and pelvis to look for lymphovascular dilatation, structural abnormalities of the urogenital system, and exclusion of nonfilarial causes, (iii) cystoscopy to look for chylous reflux and the site of the lesion, (iv) intravenous urography for renal abnormalities and pylolymphatic leaks, (v) lymphoscintigraphy to detect lymphovarix and leaks, (vi) microbiological tests including urine routine microscopy, Gram stain, ZN stain, Giemsa stain, culture, and sensitivity to identify the microfilaria and to exclude other infective causes,\(^{[7,12]}\) and (vii) immunology in the form of IgG4 enzyme-linked immunosorbent assay (ELISA) with urine samples, complement activating filarial Ag-containing immune complexes by ELISA, Ag-specific immune complex detection in the urine, and circulating immune complex Ag assay.\(^{[19,20]}\)

Among all these investigations, the intravenous urogram, lymphoscintigraphy, and immunological investigations appear to be much less important than the rest, especially in developing countries.\(^{[21]}\)

The management of these patients involves dietary manipulations, drug therapy, bed rest, and use of abdominal binders, which is believed to prevent the lymph urinary reflux by increasing intra-abdominal pressure. A diet exclusive of all fats except medium chain triglycerides, which enter the circulation through the portal system bypassing the thoracic duct, is recommended.\(^{[22]}\) Ivermectin and DEC are the most widely used antifilarial drugs. However, their macrofilaricidal activity is uncertain and may be enhanced by combination with antibiotics (e.g., tetracyclines). The duration of drug therapy varies. One of the recommendations includes a 2-week course of DEC with a single dose of ivermectin (200 µg/kg)\(^{[6]}\) or a 3-week course of DEC only. DEC also has disrepute of aggravating hematuria and chyluria in some instances. However, this problem is transient and subsides during the course of treatment.\(^{[23]}\)

Chyluria and hematuria can be precipitated by associated conditions, the treatment of which can result in relief of chyluria and hematuria.\(^{[18]}\) Improving the socioeconomic conditions is also advocated for a better long-term outcome.\(^{[25]}\)

The surgical management of intractable chyluria/hematuria includes endoscopic fistulization, endoscopic coagulation, cystoscopic silver nitrate instillation, retroperitoneal pyelolymphatic disconnections, and lymphovenous shunts.\(^{[21,25-27]}\)

No deaths owing to chyluria alone have been recorded. Spontaneous remission in half of the cases, most often within 6 months, has been noted. Recurrence of hematuria following drug therapy has been successfully
treated by a repeat course of drug therapy. The maximum
disease-free follow-up reported is up to 2 years in
medically treated patients and 7 years in surgically
treated patients.

CONCLUSION
Chyluria and hematuria are unusual manifestations of
Bancroftian filariasis. Hematuria alone is rare. The finding
of microfilaria in the urine can clinch the diagnosis but it is
a rare finding. Awareness among physicians, correct
diagnosis, and appropriate drug therapy can lead to
successful management of the condition and provide
dramatic relief to the patient.

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