

Case report

A 35-year-old man from Blue Nile State, Sudan, presented with red discoloration of his urine for the last 6 months. He had similar episodes during childhood and adolescence and was treated repeatedly with variable success. It is not known which drug(s) he received. He also reported weight loss of at least 5 kg.

On examination, he was not ill but looked somewhat wasted. The blood pressure was 120/70, the pulse rate 95/min, the respiratory rate 18/min, and the temperature was 37.0 °C. Examination of head and neck showed no abnormalities. The jugular venous pressure (JVP) was raised. The heart was enlarged on percussion; the apex beat was in the 5th intercostal space. The heart sounds were normal with a third heart sound. There was a systolic murmur at the apex radiating to the left parasternal edge to 2R (2nd intercostal space on the right). A pericardial rub was heard. Examination of the lungs was normal.

In the abdomen, the liver was 5 cm palpable below the ribcage with a blunt edge; the surface was irregular with several nodules palpable. The spleen was 5 cm enlarged under the ribcage, with smooth surface.

There were enlarged inguinal lymph nodes bilaterally that were firm on palpation.

The examination of the genitalia and the rectal examination were normal.

Extremities: pale hands. There was peripheral pitting oedema at the ankles bilaterally.

The skin showed numerous scratch marks.

Laboratory investigations

Blood

- Hb 3 g/dL
- MCV 60 μm^3
- MCH 22 pg
- MCHC 28 g/dL
- TWC $5 \times 10^9/\text{L}$
- Platelets $160 \times 10^9/\text{L}$
- Creatinine 650 $\mu\text{mol}/\text{L}$
- Potassium 6.3 mmol/L

Urine dipstick: blood +++++, no red cell or white cell casts, no white cells

Questions

1. Interpret the clinical findings.
2. Interpret the lab findings; convert the Hb 3 g/dL into mmol/L.

3. Make a problem list.
4. What diagnostic procedure would be useful in diagnosis? List the two most important ones.
5. What is the most likely diagnosis?

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Box: Normal values

	mmol/L	g/dL
Hb (male)	8.5-11.0	13-18
(female)	7.5-10.0	11.5-16

To convert:

1 mmol/L x 1.61 = 1 g/dL = g%

1 g/dL x 0.62 = 1 mmol/L

e.g., 3 mmol/L x 1.61 = 4.8 g/dL

MCV	80-110 fL	76 – 96 μ m
MCH	1600-2000 amol	27 - 32 pg
MCHC	19-23 mmol/L	31 - 35 g/dL

Ht (male)	0.4-0.54 L/L
(female)	0.37-0.47 L/L

Red cell distribution width (RDW): 11.5-14%; this is a measure for anisocytosis

Total white cell count (TWC) 4-10 x 10⁹/L

Platelets 150 - 300 x 10⁹/L

Creatinine 100 - 110 μ mol/L

Potassium 3.5 - 5.3 mmol/L

Answers

1. There are symptoms and signs of
 - anaemia (pale, ejection murmur, tachycardia, rapid pulse)
 - right sided heart failure (raised JVP, hepatomegaly, peripheral oedema); no symptoms or signs of left sided heart failure (no shortness of breath on exertion, or crepitations over the lungs).
 - pericarditis (rub)
 - urinary tract disease - haematuria
 - uraemia - pericardial rub, scratch marks
 - liver disease - cirrhosis, metastasis

2. Interpret the lab findings
 - severe microcytic, hypochromic anaemia; Hb 3 mmol/L = 4.8 g/dL
 - renal failure, hyperkalaemia

3. Problem list
 - severe microcytic anaemia
 - right sided heart failure
 - pericarditis – pericardial rub, uremic frost
 - liver disease - cirrhosis, metastasis
 - renal failure - postrenal
 - hyperkalaemia

4. Ultrasound of heart and urogenital tract
 - pericardial effusion – small to moderate
 - bladder wall thickness - thickened
 - kidney size – small, but postrenal obstruction
 - liver size and texture – enlarged, not homogenous, several metastases

Urine examination for schistosomiasis eggs: positive

Potassium level; if not available ECG: this may show peaked T-waves and small P-waves (Figure 1)

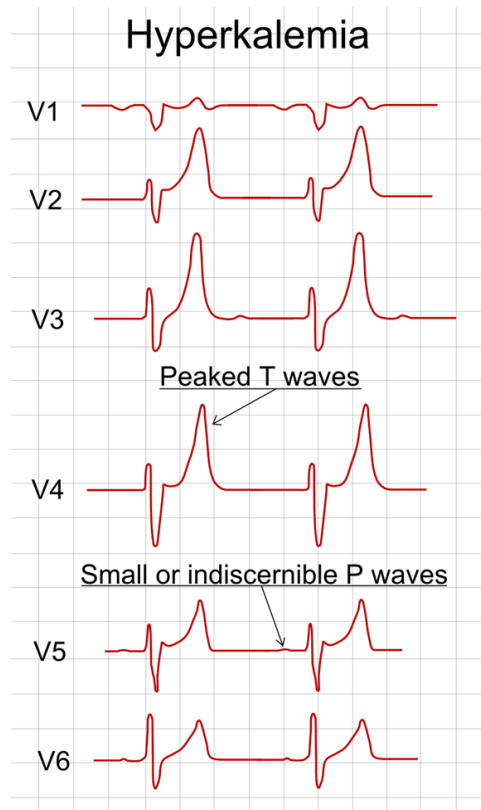


Figure 1. Typical features of hyperkalaemia in the ECG

Cystoscopy: bladder carcinoma; histology: squamous cell carcinoma

5. Diagnosis

Bladder carcinoma caused by chronic schistosomiasis with postrenal obstruction, renal failure (uraemia) and liver metastases.

Discussion

Schistosoma haematobium infection causes thickening of the bladder wall (hypertrophy) and intraluminal polyp formation, hydro-ureter(s), hydronephrosis and renal failure. Clinically this translates into micro/macroscopic haematuria, ascending infections (loss of bladder function due to fibrosis and calcification), and renal insufficiency with signs of uraemia. The chronic infection leads to histopathological changes including carcinoma.

Bladder cancer is the 10th most common cancer worldwide; there are 573,000 new cases and 213,000 deaths annually. While in most areas the geographical patterns reflect the prevalence of tobacco smoking, in northern Africa and sub-Saharan Africa, *Schistosoma haematobium* infection is a common cause, probably in conjunction with smoking, diet and other factors. In contrast to the transitional cell carcinoma present worldwide, in Schistosomiasis endemic areas often the squamous cell carcinoma type occurs. In Sudan, schistosomiasis is common along the

Nile River and as the result of agricultural development with canals of slow flowing water in which snails thrive, the intermediate host in the transmission cycle. The causative role of schistosomiasis is suggested by finding eggs in the tumour and the stereotypic histological changes in animal models and man, ranging from urothelial hyperplasia leading to urothelial carcinoma, and squamous cell metaplasia, leading to squamous cell carcinoma in situ to invasive squamous cell carcinoma. It affects a much younger population (3rd-4th decade vs 6th-7th decade). The prognosis is poor as the disease is diagnosed late, oncology services are limited and the response to radio-chemotherapy is poor. This emphasizes the role of prevention of schistosomiasis infection through mass drug administration of praziquantel.

Figure 2.

Thickening of the bladder wall, polyp formation, fibrosis, and obstruction of urine flow from ureter into the bladder, causing hydronephrer on the left (*arrow*) that may lead to hydronephrosis (MEDDIA slide series on schistosomiasis, Royal Tropical Institute, Amsterdam)

