Supported by an educational grant from Fresenius Medical Care

The Sudanese immigrant with recurrent gross haematuria—diagnosis at a glance by examination of the urine sediment

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Introduction

Schistosoma haematobium infection is a major cause of urinary tract disease in countries where it is endemic [1], in which approximately 100 million persons are affected [2]. Nowadays, as a result of tourism and immigration, infected patients can also be found in Europe. This is illustrated by the following case.

Case report

A 24-year-old Sudanese male who had entered Italy illegally in early 1997 was hospitalized in our division in December 1997 for gross haematuria associated with pollakinuria and dysuria.

The patient’s history disclosed that he had been working for several years as a fisherman in fresh water basins of his country and that in the past 2 years he had had similar episodes of gross haematuria. Physical examination was unremarkable with normal blood pressure and no tenderness in the lumbar region.

Serum creatinine and electrolytes were normal. Blood count showed mild eosinophilia. Haemoglobin electrophoresis was negative for sickle cell disease, and coagulation tests were normal.

A plain X-ray of the abdomen was negative for urinary stones; ultrasonography showed a mild bilateral pelvi-ureteric dilatation and a slight thickening of the bladder wall; i.v. pyelography confirmed the ultrasonographic findings and, in addition, showed bilateral narrowing of the distal ureters and mild irregularities of the bladder profile.

A centrifuged urine sediment, analysed by phase-contrast microscopy at 400×, showed innumerable isomorphic erythrocytes, 20–25 polymorphonuclear leukocytes/microscopic field, and several elements which could easily be identified as Schistosoma haematobium eggs (Figures 1 and 2). After these findings, cystoscopy showed hyper- 
aemia and nodules of the bladder mucosa. Biopsy showed granulomatous lesions and conglomerates of schistosomal eggs, thus confirming the diagnosis.

The patient was then treated with Praziquantel (40 mg/kg/body weight). One year later, the pelvi-ureteric dilatation had reversed, and findings on cystoscopy as well as urine sediment were normal.

Discussion

In our patient, the clue to the diagnosis was the finding of the schistosomal eggs. These measure 115–170×40–70 μm and are much larger than any other element of the urine sediment. They have a smooth surface and an ovoid shape. The anterior extremity is rounded, while the posterior extremity ends in a spine. In progressive bilharziasis the eggs contain a well preserved miracidium which shows movements. When eggs are dead movements are absent and the interior of the egg is coarsely granular (Figure 1).

These typical features render identification of the eggs easy, even when they happen to be partially covered by erythrocytes and/or leukocytes.

Since the excretion of eggs is maximal at noon [3], looking for them is preferably performed at this time of the day. Another practical way to increase the yield of the eggs in the urine is to have the patient undergo physical effort (e.g. a short run or a walk) just before the urine is passed. This facilitates the shedding of the eggs from the bladder mucosa. Filters or membranes have been proposed to find and quantify the eggs [4,5], but the use of centrifuged urine samples is a widely accepted technique, also because in developing coun-
Fig. 1. An egg of *Schistosoma haematobium*, with its typical terminal spine and internal coarse granules indicating that the egg is dead (phase contrast microscopy, ×200).

Fig. 2. An egg of *Schistosoma haematobium* with a well preserved miracidium as seen by bright field microscopy at high magnification (×400).
tries the purchase and supply of filters and membranes is often a major problem. ELISA methods based on the detection of schistosoma antigens can be used [6,7], but again they are more time-consuming and expensive than the simple analysis of the urine.

Schistosoma haematobium is a parasite which is endemic in several areas of Africa and the Middle East. The people exposed to infection are those who, like our patient, have frequent contacts with fresh water containing the snail of the genus Buletus. After infection by the parasite’s miracidia which are contained in the eggs, thousands of cercariae are delivered by the snail and enter through the skin. Through venules and/or lymphatics the cercariae reach the lungs, and then the portal system, and finally the peri-ureteral and bladder plexus. Here, the adult females deposit large amounts of eggs in the mucosa, submucosa, and even the muscular layer of the bladder, where they cause granulomatous reactions which lead to urinary tract obstruction [1,8–10]. Eggs are then shed into the urine, delivering the miracidia in fresh water which infect the Buletus snail, thus starting a new cycle.

For the nephrologist Schistosoma haematobium is interesting not only because it causes chronic renal failure due to obstructive uropathy, but also because it may cause immune-complex-mediated glomerulonephritis [11,12].

Teaching point

Conventional urine microscopy permits to make the diagnosis of Schistosoma haematobium. Today this disease occurs even in Europe and is seen in tourists or immigrants.

References