Anisocytes and poikilocytes in the urine

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Two main types of erythrocytes can be found in the urine, i.e. dysmorphic erythrocytes, which are a marker of glomerular bleeding, and isomorphic erythrocytes, which are a marker of urological disorders [1,2]. In addition, in patients with sickle cell disease, sickled erythrocytes can occasionally be seen [3].

Herein we describe another type of urinary red cells, to our knowledge never described before, which we found in a 39-year-old patient suffering from bilateral hydronephrosis caused by endometriosis and severe iron deficiency anaemia, haemoglobin 9.0 g/dl (n.v. 14–18), serum iron 30 mcg/dl (n.v. 59–158), and percent saturation of transferrin 6.7% (n.v. 30–50).

The new type of urinary erythrocyte was found during an episode of gross haematuria after bilateral pyelostomy. The urine sediment contained too many isomorphic red cells to count. Intermingled with them were several erythrocytes of abnormal size and shape (Figure 1A), which were identical to the red cells found in peripheral blood (Figure 1B). The blood smear was prepared after a negative search for haemoglobin S and the finding at automatic complete blood cell count of a + anisocytosis (=variations in cell size), a +++ poikilocytosis (= variations in cell shape) and a +++ microcytosis (= small cells).

Thus, the abnormal urinary erythrocytes were simply derived from the abnormal circulating erythrocytes which are known to haematologists as anisocytes and poikilocytes, and are a feature of various types of anaemia including that caused by iron deficiency anaemia [4].

Fig. 1. (A) Isomorphic (crenated and non-crenated) urinary erythrocytes intermingled with erythrocytes of irregular size and shape, most of which are indicated by the arrows (phase contrast microscopy, original magnification 400×). (B) Unstained peripheral blood film showing anisocytes and poikilocytes identical to those seen in the urine (arrows) (bright field microscopy, original magnification 400×).
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Conflict of interest statement. None declared.

References