

Case Report

Urinalysis (UA): a neglected but easy and inexpensive diagnostic tool

Sándor Györik¹, Peter Jandus¹ and Claudio Marone^{1,2}

¹Departement of Internal Medicine, Ospedale Regionale di Bellinzona e Valli, 6500 Bellinzona (TI) and ²Departement of Internal Medicine, Ospedale Regionale di Bellinzona e Valli and University of Bern, Bern, Switzerland

Correspondence and offprint requests to: Claudio Marone; E-mail: claudio.marone@eoc.ch

Abstract

The case history of a 75-year-old woman, who was hospitalized with the diagnosis of an acute erosive colitis, is presented. The patient was treated with hysterectomy for an endometrial cancer in 2000 and had suffered from multiple sclerosis for 15 years. A persistent non-productive cough with fever requested a pneumological consultation. Multiple small alveolar opacities and cavitating lesions were found at chest imaging, but no precise diagnosis was possible. Only 3 weeks after hospitalization, we noticed that a urine analysis had been forgotten. This additional test clearly demonstrated a nephritic sediment and further analysis confirmed the diagnosis of a ANCA-positive microscopic polyangiitis, which promptly responded to immunosuppressive therapy. The necessity of a routine urine analysis in the majority of internal medicine patients and the possible link between small vessel vasculitis and multiple sclerosis are discussed.

Keywords: multiple sclerosis; small vessel vasculitis; urine analysis

Case report

A 75-year-old woman presented to the emergency room with acute rectorrhagia, pain in the right lower abdominal quadrant, nausea and vomiting. She complained of a persistent non-productive cough and intermittent fever reaching 38°C during the last month. She had undergone a hysterectomy 8 years earlier due to endometrial cancer staged T1, N0, M0 and was treated with interferon for 15 years for multiple sclerosis.

On examination, her temperature was 36.8°C. There was severe pain upon palpation of the right lower abdominal quadrant without defence. Blood analysis revealed an elevated C-reactive protein of 160 mg/l (<5 mg/l) and a normochromic anaemia of 83 g/l. The patient was hospitalized in the surgery unit. A colonoscopy revealed inflammatory lesions. In the ascendant colon, a histological examination disclosed acute erosive colitis. Antibiotic therapy was started with cefepime (2 g b.i.d.) and metronidazole

(500 mg t.i.d.). The bleeding stopped, the inflammatory parameters decreased and partial relief of the abdominal pain was noted; however, the cough still persisted.

A week after hospitalization, a pneumological consultant was asked to examine the patient. The chest x-ray showed multiple small alveolar opacities, and a chest CT scan confirmed multiple nodular and slightly cavitating lesions (Figure 1). After the introduction of clarithromycin, fever and inflammatory markers improved. Pulmonary function tests revealed a moderate, non-reversible obstruction with mild restriction, but the patient had never smoked and had never previously experienced pulmonary disease. The differential diagnosis at that time included pneumonia, septic embolism, sarcoidosis, tuberculosis, cryptogenic organizing pneumonia, metastasis and Wegener granulomatosis. A bronchoscopy was performed. Extensive search for an infective agent (including tuberculosis, fungi, and pneumocystis among others) in the bronchoalveolar lavage and transbronchial biopsies was found to be negative. The cellular distribution of the lavage showed mild neutrophilia (15%, normal range <2%) and very mild eosinophilia (2%, normal range <0.5%), but no malignant cells were found. Histology showed acute inflammation without granulomas or signs of vasculitis.

The next day, the patient was transferred to our medical unit. Reviewing the case history, we noted that a urine analysis had never been performed. The sediment showed 10–20 erythrocytes per field with glomerular features, 5–10 leucocytes per field and hyaline and granular casts. The patient's proteinuria was estimated to be 800 mg/24 h. Her creatinine level was moderately elevated at 96 µmol/l, with a measured clearance of 47 ml/min. These results, coupled with an elevated MPO-ANCA titre (100 U/ml, normal range <15 U/ml), raised the suspicion of systemic vasculitis with glomerular involvement. Therefore, a renal biopsy performed on the 19th day depicted focal and segmental necrotizing glomerulonephritis, with early crescent formation (the renal sample contained 15 glomeruli, 4 of which were globally sclerotic; one showed the signs of a recent fibrinoid necrosis and three others showed cellular crescents) associated with arteriolar sclerotic lesions.

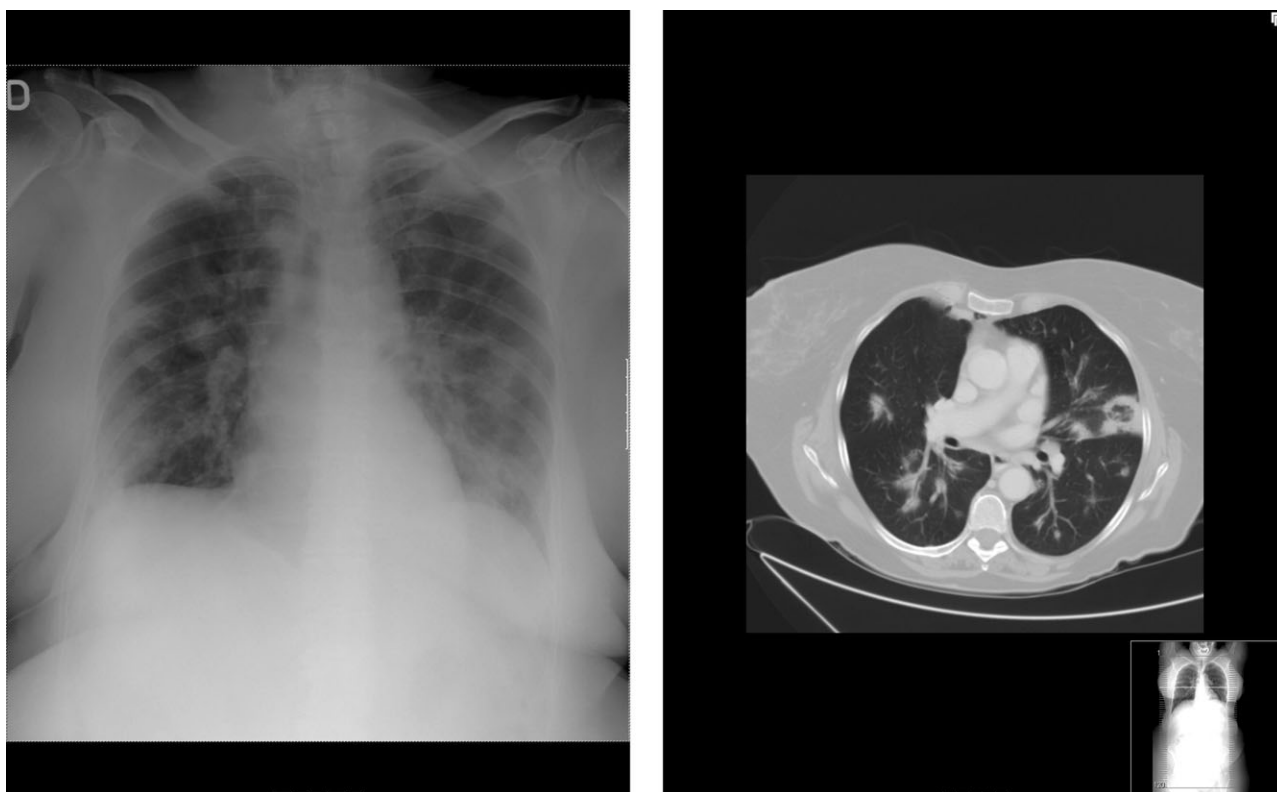


Fig. 1. Chest x-ray and CT scan showing bilateral multiple alveolar opacities and cavitating lesions.

Based upon all collected data, a diagnosis of ANCA-positive microscopic polyangiitis extended disease was made with renal, gastro-intestinal and pulmonary involvement. A therapy comprising high-dose steroids (1 g methylprednisolone i.v./day for 3 days followed by prednisone oral 1 mg/kg BW) and cyclophosphamide (2 mg/kg BW/day) was started and produced sudden and progressive improvement of the clinical situation (serum creatinine 80 μ mol/l, urine sediment with 0–2 erythrocytes per field, no casts and proteinuria <150 mg/24 h) 3 months after diagnosis.

The radiological abnormalities of the chest disappeared, and follow-up lung function tests showed complete resolution of the obstructive and restrictive changes.

Discussion

The utility and cost-benefit of routine urinalysis (UA) upon admission has previously been debated and the conclusions were rather negative [1–4].

The European Urinalysis guidelines attest that urine examinations should always be performed on the basis of medical need, which is a very frequent condition in an internal medical ward [5].

The fact that UA is an old fashioned, and unsophisticated test led to a progressive decline in its correct use and consideration for diagnostic decision making. In hospitals like ours, it is often forgotten in crowded emergency rooms and thereafter not performed. Even if it is performed, doc-

tors rarely follow-up on the results. De Mar *et al.* found in their series that at least 12% of results were not recorded in patient charts [1]. All of these conditions led to the perception that UA is more of a tradition than a useful clinical tool, even when there are less obvious but still important clinical reasons for its performance [5].

In our case, the surgeon failed to prescribe the proposed test for many days. Indeed, the test was finally prescribed and urine was collected only after the patient arrived at the internal medicine ward. The results of the UA led to the suspicion of vasculitis and finally the correct diagnosis, but only after many days of hospitalization.

We believe that UA should still remain a routine test for specific populations (suspicion of urinary tract infection, of non-infectious renal disease, either primary or secondary to systemic diseases, such as rheumatic diseases, etc.) [5] and the difficulty in performing it (i.e. because either patients and nursing staff often forget to collect the urine sample or the patient is unable to urinate at the time the test is needed) led to an underutilization of this simple, inexpensive and frequently useful (if clinically indicated) test. We can go even further and say that any systemic disease should have an UA done (dipsticks and sediment).

We therefore insist on the fact that UA not only comprehensive of dipsticks but also of sediment examination should be performed in the majority of patients presenting to an internal medicine ward. In the case of vasculitis, positive dipsticks for haemoglobin and protein with a urine sediment containing glomerular erythrocytes associated with erythrocytic casts can be diagnostic and permit to

start the adequate therapy in shorter time. With this simple and inexpensive approach, as suggested by others [6], it is possible to favour a prompt diagnosis and save the patient from a progressive renal disease.

Pulmonary and gastrointestinal manifestations can occur in as many as 50% of the cases of microscopic polyangiitis, and renal involvement is present in >90% of cases. A particular feature of our case was the initial symptom of cough that the patient had experienced during 3 months prior to hospitalization. This was accompanied later by non-reversible obstruction in the lung function tests, a symptom far less common in microscopic polyangiitis than Churg-Strauss syndrome or Wegener granulomatosis. This finding underlines the usefulness of performing a chest x-ray in cases of chronic unexplained cough, which would likely have revealed the alveolar opacities prior to the development of systemic symptoms.

Another question centres on the potential relationship between multiple sclerosis (MS) and ANCA positive disease. Various studies report controversial results [7–11]. An abnormally high frequency of circulating autoantibodies has been reported in patients with MS [12]. Whether these autoantibodies really demonstrate any clinical significance or instead only represent an epiphenomenon remains at present unknown.

Conflict of interest statement. None declared.

References

1. Del Mar C, Badger P. The place of routine urine testing on admission to hospital. *Med J Aust* 1989; 151: 151–153
2. Akin BV, Hubbell FA, Frye EB *et al.* Efficacy of the routine admission urinalysis. *Am J Med* 1987; 82: 719–722
3. Kroenke K, Hanley JF, Copley JB *et al.* The admission urinalysis: impact on patient care. *J Gen Intern Med* 1986; 1: 238–242
4. Pashayan N, Khogali M, Major SC. Routine urinalysis of patients in hospital in Lebanon: how worthwhile is it? *J Med Screen* 2002; 9: 181–186
5. Kouri TT *et al.* European Urinalysis Guidelines. *Scand J Clin Lab Invest* 2000; 60(suppl. 231): 1–96
6. Verdesca S, Brambilla C, Garigali G *et al.* How a skilful and motivated urinary sediment examination can save the kidneys. *Nephrol Dial Transplant* 2007; 22: 1778–1781
7. Midgard R *et al.* Multiple sclerosis and chronic inflammatory disease. *Acta Neurol Scand* 1996; 93: 322–328
8. Seyfert S *et al.* Multiple sclerosis and other autoimmune diseases. *Acta Neurol Scand* 1990; 81: 37–42
9. Karni A, Abramsky O. Association of MS with thyroid disorder. *Neurology* 1999; 53: 883–885
10. Henderson RD, Bain CJ, Pender MP. The occurrence of autoimmune disease in patients with multiple sclerosis and their families. *J Clin Neurosci* 2000; 7: 434–437
11. Ramagopalan SV *et al.* Autoimmune disease in families with multiple sclerosis: a population-based study. *Lancet Neurol* 2007; 6: 604–610
12. Spadaro M *et al.* Autoimmunity in multiple sclerosis: study of a wide spectrum of autoantibodies. *Multi Scler* 1999; 5: 121–125

Received for publication: 4.3.09; Accepted in revised form: 24.6.09