

## Two cases of swine H1N1 influenza presenting with hematuria as prodrome

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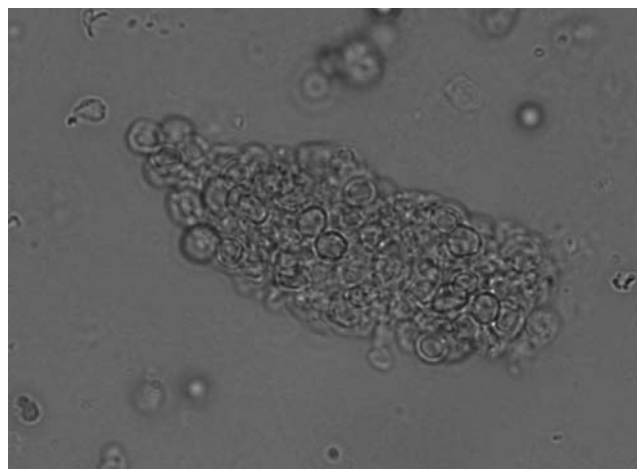
The multiorgan distribution of human influenza A (H1N1) virus is unknown. Studies in mouse models suggest a more common multiple organ localization than previously believed, including the lung, heart, thymus, liver and spleen [1]. Renal localization has never been reported [2].

We describe here two children who presented with hematuria 48 h before the start of classical pulmonary signs of influenza. The first patient was a 7-year female child who developed hemorrhagic cystitis with fever and was admitted to our hospital for clinical tests and therapy. Urinalysis showed the presence of normally shaped red blood cells, and the renal sonography scan revealed no abnormalities. Renal function was normal. After 48 h of intravenous ceftriaxone, the fever peaked at 39°C, and the child developed a non-productive cough without any alterations visible on the chest X-ray. After 48 h, the hematuria disappeared; the fever remitted after 96 h, and clinical conditions slowly improved.

The second patient was a 13-year-old male adolescent who was admitted for macroscopic hematuria and fever. At

presentation, the urine sediment showed the presence of casts, mostly cellular and jalinogranulose (Fig. 1); immunological tests (antinuclear antibodies, anti-double-stranded DNA, anti-neutrophil cytoplasmic antibodies, complement, immunoglobulins) were negative, and renal function was normal. Renal sonography showed normal kidney and urinary tract morphology. Also in this case, the fever peaked after 48 h, with minimal signs of respiratory involvement, and slowly decreased. Micro-hematuria and cellular casts in the sediment were still present after 7 days. Real time PCR for H1N1 demonstrated in both cases the presence of H1N1 virus in respiratory specimens; blood and urine were negative for the presence of the virus.

Macroscopic hematuria may be the first sign of an incoming H1N1 viral episode. In our two patients,



**Fig. 1** Urine sediment obtained from a child with macroscopic hematuria and fever showing the presence of cellular casts. Magnification, 400×

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hematuria had a different origin (i.e. from the lower urinary tract and from the glomerulus, respectively) and was likely supported by different mechanisms. Clinically, the general outcome was good in one patient, with a rapid normalization of urinalysis, but urinary signs persisted in the other. The H1N1 amplification test may simplify the clinical approach and should be considered in cases of unexplained hematuria with fever and cough.

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