

Purple urine bag syndrome

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CASE REPORT

A 72-year-old man was admitted to the internal medical ward with the suspicion of a sepsis on top of his metastasised bladder cancer. The home care nurse reported that during the days before admission he had not been eating and barely drinking. Because of increased back pain he had used more morphine, without being able to take laxatives. At physical examination the patient had fever (38.6°C) and a blood pressure of 90/64 mmHg with a pulse rate of 104 beats/min. He was cachectic, dehydrated and constipated and had no clinical focus of infection. Laboratory investigations revealed a white blood cell count of $15.5 \times 10^9/l$, C-reactive protein 37 mg/l, urea 31.6 mmol/l and creatinine 189 $\mu\text{mol/l}$. A chest X-ray did not show pulmonary infiltrates. He received an indwelling urinary catheter, intravenous fluids and, after blood and urine cultures had been taken, cefuroxime.

The morning after admission an intense purple discolouration of his urine and the drainage system was noted (*figure 1*).

WHAT IS YOUR DIAGNOSIS?

See page 341 for the answer to this photo quiz.

Figure 1. Purple urine discolouration



DIAGNOSIS

The urine culture showed a mixture of several bacteria, one group was determined as *Klebsiella pneumoniae*. The patient had not eaten red beets, nor had mitoxantrone chemotherapy, which can both change the colour of the urine into purple.

We diagnosed the purple urine bag syndrome, in this patient presumably caused by a urinary tract infection with *Klebsiella pneumoniae*.

The aetiology of the purple colour of the urine: is as follows. Bacteria such as *Klebsiella pneumoniae*, *Escherichia coli* and *Providencia stuartii* have an enzyme called indoxyl sulphatase/phosphatase. This enzyme transforms urinary indoxylsulphate, a residual product of metabolised dietary tryptophan, into indigo (blue) and indirubin (red), in combination purple.¹ The combination of urine and indoxyl sulphatase/phosphatase producing bacteria is sufficient to colour agar culture plates purple. The intensity of the colour varies and depends on individual characteristics of the patient and bacteria and increases with constipation (longer resorption time of tryptophan) and with alkaline urine.² Furthermore, an interaction of the bacteria, urine and the polyvinylchloride of the urine bag can enhance the purplish colour. The purple colour can disappear spontaneously or after treatment of the urinary tract infection. In our patient it disappeared after the start of cefuroxime. We would like to stress

that asymptomatic patients with bacteriuria do not need antibiotic treatment: The urine of many asymptomatic patients with an indwelling urinary catheter is colonised with bacteria, often resistant to multiple antibiotics. The prevalence of purple urine bags in patients with a chronic indwelling catheter varies from 8 to 16%.³ It has most often been observed in older patients, who have the highest prevalence of indwelling urinary catheters, constipation and urinary tract infections. A short look at the urine bag can draw attention to a urinary tract infection⁴ and explanation of the phenomenon to patients and carers can reduce unnecessary concerns and investigations.

REFERENCES

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