

Images in Nephrology
(Section Editor: G. H. Neild)

Purple urine bag syndrome (PUBS)

Athanasios C. Liolios, Erich Woess and Karl Lhotta

Department of Nephrology and Dialysis, Academic Teaching Hospital Feldkirch, Feldkirch, Austria

Keywords: catheterization; tryptophane; urinary tract infection

A purple discolouration of urine and the urine bag was observed in a 73-year-old female patient suffering from alpha 1-antitrypsin deficiency and acute on chronic renal failure caused by ACE inhibitors and diuretics. The patient was fairly immobile after a trauma and constipated from morphine analgesics. A urinary tract infection was diagnosed, and a urine culture grew *Escherichia coli* and *Proteus vulgaris*. The infection was treated with ciprofloxacin and

the catheter exchanged. Subsequently urine, catheter and bag showed normal colour.

PUBS is a rare phenomenon mainly observed in long-term catheterized women who are constipated and have urinary tract infections [1]. Although not definitely proven, the following chain of events seems to cause PUBS. Constipation leads to increased metabolism of dietary tryptophane to indole in the gastrointestinal tract. In the liver, indole is detoxified to indoxyl sulphate, which is then excreted in the urine. In the case of a urinary tract infection with indoxyl sulphatase/phosphatase-producing bacteria such as *E. coli*, *P. vulgaris*, *Proteus mirabilis*, *Pseudomonas aeruginosa*,



Correspondence and offprint requests to: Karl Lhotta, Academic Teaching Hospital Feldkirch, Carinagasse 47, A-6800 Feldkirch, Austria. Tel: +43-5522-303-2700; Fax: +43-5522-303-7506; E-mail: karl.lhotta@lkhf.at

Morganella morganii or *Klebsiella pneumoniae*, the bacteria will produce indoxyl [2]. In strongly alkaline urine, indoxyl is converted to indigo (blue colour) on the plastic surface and indirubin (red colour), which is dissolved in the plastic, and together cause the typical purple colouration.

Conflict of interest statement. None declared.

References

1. Mantani N, Ochiai H, Imanishi H *et al.* A case-control study of purple urine bag syndrome in geriatric wards. *J Infect Chemother* 2003; 9: 53–57
2. Dealler SF, Hawkey PM, Millar MR. Enzymatic degradation of urinary indoxyl sulfate by *Providencia stuartii* and *Klebsiella pneumoniae* causes the purple urine bag syndrome. *J Clin Microbiol* 1988; 26: 2152–2156

Received for publication: 10.4.08

Accepted in revised form: 25.4.08