

## Purple Urine Bag Syndrome in a Male Patient with Chronic Hemodialysis

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A 78-year-old male patient who had an indwelling urinary catheter because of benign hyperplasia of the prostate and who had been receiving hemodialysis twice a week due to end-stage renal disease was admitted to our hospital complaining of three days of purple urine color (Figure 1). His medications included beta blocker, anti-aggregant, erythropoietin, piracetam and calcitriol therapies. A urine analysis was performed; the results were as follows: pH: 8.0, density: 1012, leukocyte esterase: (++) , leukocyte: 11/HPF (high power field), erythrocyte: 4/HPF and nitrite: negative. The diagnosis of purple urine bag syndrome (PUBS) was made. Treatment with ceftriaxone 2 g/day intravenously (IV) was started immediately on an empirical basis, and the catheter was replaced. Extended-spectrum beta-lactamase-positive *Escherichia coli* was isolated in urine culture, and the antibiotic therapy was changed to imipenem/cilastatin 250 mg IV twice daily. On the fifth day of treatment, the patient's urine color returned to normal, and a urine sample was negative for leukocyte esterase.

Discoloration of urine is important in clinical diagnosis and treatment. PUBS stands for purple discoloration of the urine occurring in patients with long-term urinary catheterization. The interesting point of this syndrome is that the urine itself is unchanged in color but the only change in color is within the bag itself. Reported risk factors of PUBS include chronic urinary catheterization, old age, female gender, dehydration, bedridden, constipation, advanced chronic kidney disease, alkaline or acidic urine, and PVC catheters and bags (1-3). Briefly, pathogenesis is related to sulfatase and/or phosphatase enzyme carrying bacteria (such as *Klebsiella*, *E. Coli*, *Morganella*, *Pseudomonas*, *Enterobacter*; *Proteus*) (1) that leads to metabolize indican into indigo (blue pigment) and indirubin (red pigment) in the urine which results purple discoloration of urine in the plastic of the urine bag (4).



FIG. 1. Purple discoloration of the urine when the patient was admitted to the hospital

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Purple urine bag syndrome actually is not very rare, especially in chronically debilitated patients and in elderly patients who also tend to have several comorbidities (1,2). PUBS is essentially harmless, although it can be alarming to both patients and doctor. The underlying urinary tract infection can lead to serious consequences. Because of PUBS itself is a benign and harmless condition, therapy should be targeted at the causative medical problem rather than at PUBS itself.

Purple urine bag syndrome is usually associated with higher incidence of mortality and morbidity than urinary tract infection alone (5). This may be caused by the fact that patients with PUBS could be more prone to developing complications of infection, such as urosepsis, as they frequently have several or serious comorbidities. Thus, physicians should be aware of the fact that this syndrome could be a signal for a urinary tract infection which is needed immediately to start an aggressive treatment (5).

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