Purple urinary bag syndrome: what every primary healthcare provider should know

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Accepted 3 July 2018

DESCRIPTION

A 70-year-old man with bladder outlet obstruction due to benign prostatic hyperplasia who was on urethral (Foley) catheter presented to us with complaint of purple discoloration of his urine collection bag (figure 1). He had history of multiple failed trials of voiding without catheter. Along with this he had constipation for which he was already taking laxatives. He was on Foley catheter for 6 months (which was changed every 3 weeks) and now was planned for transurethral resection of prostate (TURP). He was alarmed by this discolouration. His urine was clear but the urine collection bag had a purple discolouration. On microscopic examination, his urine had plenty of leucocytes and his urinary pH was 8. His urine culture was positive for *Escherichia coli* ($>10^5$ colony forming units/mL). His serum creatinine was 0.9 mg/dL. A diagnosis of purple urinary bag syndrome (PUBS) was made. His catheter was replaced and he was treated with culture-guided antibiotics. He was counselled regarding the benign nature of this discolouration. Two weeks later, he underwent TURP and was discharged uneventfully.

Figure 1 Purple discolouration of urine collection bag—PUBS. PUBS, purple urinary bag syndrome.

PUBS is usually a side effect of prolonged catheterisation (per-urethral or suprapubic) along with urinary tract infection (UTI). Other risk factors for PUBS include alkaline urine, female gender (increased risk of UTI due to shorter urethra), constipation (gives more time for bacterial action on tryptophan metabolites) and chronic renal failure (diminished clearance of tryptophan metabolites).[1] The bluish discoloration is proposed to be due to the breakdown of metabolites of tryptophan by bacteria. This usually occurs in alkaline urine though a case of PUBS in acidic urine has also been reported.[2] Many bacteria have been implicated in the pathogenesis of PUBS that include *E. coli*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, *Klebsiella*, *Enterococci* and Group B *Streptococci*. A series of biochemical reactions take place within the tubing and bag that start with deamination of tryptophan. Indole produced from this conjugates to form indican (indoxyl sulfate), which oxidises into blue coloured indigo and red coloured indirubin. The combination of indigo and indirubin gives a purple hue to the urine collection bag.[1] The discolouration itself is benign. The underlying UTI is of more concern. The management of PUBS includes changing the catheter and urine collection bag along with treating the underlying UTI with appropriate antibiotics. The patients who are on prolonged catheterisation may not show classical signs of UTI due to various comorbidities and PUBS may serve as an indicator of UTI in them.[3] For the patient, bluish discolouration of his urine may be alarming. It is important that a primary care physician knows about the pathogenesis and management of this entity so that he may allay patient concern.

Learning points

- Purple urinary bag syndrome (PUBS) is in itself a benign condition that occurs due to breakdown of tryptophan metabolites in alkaline urine by bacteria, the underlying urinary tract infection (UTI) is the more concerning thing in a patient with PUBS.
- The management of PUBS includes change of urinary catheter and collection bag along with treatment of underlying UTI.
- PUBS may serve as an indicator of UTI in patients with various comorbidities as they may not manifest the classical signs of UTI.

To cite: Pandey S, Pandey T, Sharma A, *et al*. *BMJ Case Rep* Published Online First: [*please include* Day Month Year]. doi:10.1136/bcr-2018-226395

Contributors SP conceived the case report. SP and TP were major contributors towards writing the manuscript. AS, SS and SP treated the patient and also interpreted the patient data. SP and TP were involved in the review. All authors read and approved the final manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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