Purple urine bag syndrome: Case report from a nursing home resident with a false alarm of urosepsis

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SUMMARY

Purple urine bag syndrome (PUBS), as the name implies produces purplish discoloration of the urine. It is commonly observed among elderly women with constipation, and individuals with long term catheter in the setting of urinary tract infection (UTI). From the literature research, there were no publications on PUBS in Malaysia; however we believe that it is underreported. We present a unique case of this rare condition occurring in a 68-year-old man, a nursing home resident on long term urinary catheter. The urine cleared after hydration, antibiotic therapy and replacement of the catheter.

KEY WORDS:
Purple urine bag syndrome, urinary tract infection, long term catheter

INTRODUCTION

PUBS is a rare condition. It is usually benign in nature, however the unfavourable appearance of the urine may be alarming to the patient, family and health-care workers especially to those who are unaware of the disease. The purplish appearance is due to combination of indigo and indirubin pigments which occurs due to several predisposing factors such as long term use of urinary catheter, bed bound states, dementia, diabetic nephropathy, chronic constipation, intestinal obstruction, the use of plastic catheter, alkaline urine, dehydration, azotemia, and chronic kidney disease.[1,2] PUBS is treatable condition and seldom leads to mortality. We discuss a case of PUBS in an elderly man on suprapubic catheter with no evidence of urosepsis.

CASE REPORT

A 68-year-old Malay man on long term suprapubic Foley catheter presented with purplish discoloration of the urine which started 10 days prior to admission. He was later brought to the hospital as the caretaker was alarmed that the urine became darker in colour (Figure 1) and foul smelling. Patient was not brought earlier as he did not have any symptoms and it was thought to be benign. Patient is a nursing home resident and has been bed bound for the last 2 years due to paraplegia following motor vehicle accident. The suprapubic catheter was last changed a month ago. He did not have any fever, urinary tract infection (UTI) symptoms and altered bowel habits nor does he gave any history of recurrent UTI.

On presentation his hydration status was fair and he was not septic. His blood pressure was 145/74 mm/Hg, pulse rate was 87 beats per minute and patient was afebrile. Apart from paraplegia, other clinical examinations were unremarkable. Laboratory investigations revealed haemoglobin of 10.9 g/dL, total white cell count was 8.1 x 10^9/litre, platelet of 342 x 10^9/litre, blood urea of 4.5 mmol/L and creatinine of 88umol/L. Urine analysis showed urine pH of 9, leucocyte was 3+, erythrocyte was 4+, and nitrite was negative.

Patient was started on intravenous ceftriaxone 2 gram daily to cover for possible urinary tract infection while waiting for cultures. Following hydration and replacement of suprapubic catheter, the urine became clear the next day. Patient remained afebrile in the ward and urine persistently clear thereafter. The urine culture showed mixed growth of 10,000-100,000/ml urine while the blood culture had no growth. He was discharged well with oral cefuroxime 500mg twice daily for 5 days.

DISCUSSION

Purple urine bag syndrome is an unusual presentation of urinary tract infection in elderly. Although was thought to be a rare phenomenon, a study Lin CH *et al.* showed a prevalence rate of 42.9% (eight out of 19) in urinary catheterised nursing home residents.[3] However, a larger study is needed to evaluate its prevalence in the community.

Metabolism of tryptophan is responsible for the pathogenesis of PUBS. Intestinal bacteria such as *Proteus mirabilis* converts it to indole which is later metabolised to indoxyl sulfate in the liver. Indole sulfate is then catalysed by bacterial phosphatases or sulfatases to indoxyl. In urine, indoxyl is converted into two pigments, indigo (blue) and indirubin (red). Combinations of these two pigments create a purple color.[3]

PUBS has various predisposing factors. A study by Lin CH of 10 PUBS cases from nursing homes between 1987 and 2007 showed the mean age of the patient was 75.30 years (SD 8.39, range 60–89). In that study, patient was on urinary catheterisation for an average of 35.9 months (SD 18.66, range 12–72).[5] Apart from elderly institutionalised patients with urinary catheter, it is also found more commonly in bed bound states, Alzheimer's, or dementia from other causes, and diabetic nephropathy.

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Fig. 1: Suprapubic catheter bag showing purplish discoloration of the urine.

Other risk factors are females (due to short urethra and close proximity with anus), those with chronic constipation and intestinal obstruction (due to bacteria overgrowth), the use of plastic catheter and urine, alkaline urine, dehydration, azotemia, and chronic kidney disease.[1,2]

Long term use of suprapubic catheter was the only apparent risk factor for PUBS for our patient. The presence of alkaline urine in our patient may be another important factor for precipitation of the causative pigments.

Despite the good outcome of PUBS, this condition should not be overlooked as it may not always be benign. Some immunocompromised patients with PUBS may developed fournier's gangrene,[3] and there are few mortalities reported in the literature.[4] Hence, early recognition and initiation of therapy is needed especially in high risk symptomatic patients. Antibiotics selected should be individualised based on case to case basis taking into account the possible underlying organism while awaiting culture. Organisms reported in the literature that causes PUBS includes *Escherichia coli, Klebsiella pneumoniae, Citrobacter* species, *Enterobacter* species, *Enterococcus* species, *Morganella morganii, Proteus* species Methicillin-resistant *Staphylococcus aureus, Pseudomonas Aeroginosa*, and *Providencia stuartii.*[1,3]

As for asymptomatic individuals, there is no consensus yet on the ideal management. Changing the catheter alone may be sufficient in certain cases.[5] Starting ceftriaxone in our patient was probably overkill since patient had no evidence of urosepsis. One explanation for this is the unawareness of this condition among the health care workers and the 'malignant' appearance of the urine which was alarming. The presence of mixed growth in the urine might represent contamination and not a true culture.

In conclusion, PUBS, is a relatively a benign condition. In Malaysia, there is vastly growing number of nursing homes and awareness needs to be addressed to health-care workers and support group on PUBS prevention. Reducing the duration of catheterization, improving urological sanitation and control of constipation by appropriate nutritional management are key elements for the prevention of PUBS.[3]

REFERENCES

1. Hadano Y, Shimizu T, Takada S, *et al.* An update on purple urine bag syndrome. Int J Gen Med. 2012; 5: 707-10.
2. Lin CH, Huang HT, Chien CC, *et al.* Purple urine bag syndrome in nursing homes ten elderly case reports and a literature review. Clin Interv Aging. 2008; 3(4): 729-34.
3. Yang CJ, Lu PL, Chen TC, Tasi YM, *et al.* Chronic kidney disease is a potential risk factor for the development of purple urine bag syndrome. J Am Geriatr Soc. 2009; 57(10): 1937-8.
4. Bhattarai M, Mukhtar H, Davis TW, *et al.* Purple urine bag syndrome may not be benign a case report and brief review of the literature. Case Rep Infect Dis. 2013: 863853.
5. Ihama Y, Hokama A. Purple urine bag syndrome. Urology. 2002; 60(5): 910.