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PURPLE URINE BAG SYNDROME (PUBS): SEEING THE INVISIBLE!

Urology

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ABSTRACT

When urobag and tube for a foley catheterized patient changes its colour to purple, patient and relatives get anxious, concerned and seek immediate attention to hospital. Spot diagnosis which clinician has to make is a Urinary Tract Infection with specific bacteria that produce sulphatases and phosphatases. Many predisposing factors have been recognized: female gender, advanced age, constipation, long-term catheterization, CKD and especially patients in bedridden state. Though the entity is uncommon, proper identification and treatment is necessary. 10 Patients presenting to hospital with urine bag changing to purple colour were included in the study. All patients included in study were found to have UTI. 6 patients had E.coli, 2 had Klebsiella pneumoniae, 1 had Citrobacter species and 1 had Proteus species. Enzyme indoxyl sulfatase produced by bacteria in urine is responsible for reaction. This converts indoxyl sulfate in urine into red, blue coloured compounds indirubin and indigo. A mixture of both these compounds gives blue colour. There are several bacteria, mostly Gram negative, which have been associated with PUBS, though it is often a mixture which leads to PUBS. It is important to note that not all bacteria can cause PUBS, even among the same species, and this is why PUBS is so rare. Management of this condition includes reassurance, antibiotics, and regular change of catheters.

KEYWORDS

Catheterization, PUBS, Infection, Bacteria.

INTRODUCTION

Purple urine bag syndrome usually doesn't cause any symptoms for its sufferers. The idea of PUBS is not new, but has long been unseen. This phenomenon may be misdiagnosed by clinicians who are unaware of it. When urobag and tube for a foley catheterized patient changes its colour to purple, patient and relatives get anxious, concerned and seek immediate attention to hospital. Spot diagnosis which clinician has to make is a Urinary Tract Infection with specific bacteria that produce sulphatases and phosphatases. A person with chronic catheterization and constipation is most likely to develop PUBS, with estimates ranging from 8.3% and 42.1%. The metabolites of tryptophan are believed by most to lead to the purple urine. The Gastrointestinal tract is responsible for metabolising tryptophan into indole and absorbing it into the bloodstream. Tryptophan is converted into indole by the presence of bacteria in the colon during chronic constipation. In the bowels, tryptophan transits more slowly due to constipation. It is the liver that converts indole into indoxyl sulphate. Consequently, urinary indoxyl sulphate concentrations rise. Some bacteria produce an enzyme that converts indoxyl sulphate into indoxyl in the urine. During alkaline urine metabolism, indoxyl becomes indigo - blue colour and indirubin - red colour, which mix to produce purple urine. An indoxyl sulphate-to-indoxyl conversion is increased by catheter-associated urinary tract infections. In some patients, steroidal or bile acid conjugates can make up the violent pigment. Many predisposing factors have been recognized: female gender, advanced age, constipation, long-term catheterization, CKD and especially patients in bedridden state. In general, PUBS is a benign process. Though the entity is uncommon, proper identification and treatment is necessary.

MATERIALS AND METHODS

10 Patients presenting to hospital with urine bag changing to purple colour were included in the study. Detailed history taking and clinical examination was done. Various foods may cause a change in urinary colour in patients, such as beets, blackberries and carrots. Therefore, quantifying their intake is important. Basic blood investigations, urinalysis and urine for culture and sensitivity were done. These patients were mostly elderly with a mean age of 64.2 yrs and with a history of chronic catheterization with repeated urinary tract infections in the past. The patients were initially treated empirically with fluoroquinolones and once the urine culture and sensitivity reports were available, treatment with the sensitive antibiotic was initiated and the course of antibiotic completed. The constipated patients were treated with appropriate Laxatives. The foley catheters which were due for change were exchanged.

RESULTS

All patients included in the study were found to have UTI. There were 4 male patients and 6 female patients. These patients were mostly elderly with a mean age of 64.2 yrs and with a history of chronic catheterization with repeated urinary tract infections in the past. 7 patients had complaints of constipation with intermittent on and off episodes. There were no other noteworthy symptoms found during the other examinations. All the urine samples had shown alkaline urine on urinalysis. 6 patients had E.coli, 2 had Klebsiella pneumoniae, 1 had Citrobacter species and 1 had Proteus species. All patients had stable vital signs, and no infection sign such as leukocytosis, fever, or chill was found, even though PUBS and bacteriuria persisted. 8 patients gave significant history of recurrent Urinary Tract Infections in the past for which they had taken treatment.

CONCLUSIONS

Enzyme indoxyl sulfatase produced by bacteria in urine is responsible for reaction. This converts indoxyl sulfate in urine into red, blue coloured compounds indirubin and indigo. A mixture of both these compounds gives purple colour. A coating layer is produced by interactions between the indicians and the plastic of the catheter bag and tubing leading to a deep purplish discolouration. Urine that is left in contact with catheter plastic for a longer period of time produces a more deeper purple colour. There are several bacteria, mostly Gram negative, which have been associated with PUBS. These include Providencia stuartii and Providencia rettgeri, Klebsiella pneumoniae, Proteus mirabilis, Escherichia coli, Enterococcus species, Morganella morganii, Pseudomonas aeruginosa, Citrobacter species, and group B Streptococci, though it is often a mixture which leads to PUBS. It is important to note that not all bacteria can cause PUBS, even among same species, and this is why PUBS is so rare. Management of this condition includes reassurance, antibiotics, and regular change of catheters. Recurrent urinary tract infections signalled by this syndrome should be kept in mind by the treating physicians.

REFERENCES

1. Yang HW, Su YJ. Trends in the epidemiology of purple urine bag syndrome: A systematic review. Biomed Rep. 2018;8(3):249-256. doi:10.3892/br.2018.1046
2. Khan, F., Chaudhry, M. A., Qureshi, N., & Cowley, B. (2011). Purple urine bag syndrome: an alarming hue? A brief review of the literature. International Journal of Nephrology, 2011, 419213.
3. Ollapallil, J., Irukulla, S., & Gunawardena, I. (2002). Purple urine bag syndrome: Journal of Surgery, 72(4), 309–310.
4. Vallego-Munzur, F., Mireles-Cabodevila, E., & Varon, J. (2005). Purple urine bag syndrome. Am J Emerg Med, 23, 521–524.
5. Robinson, J. (2003). Purple urinary bag syndrome: a harmless but alarming problem. British Journal of Community Nursing, 8(6), 263–266.
6. Pillai, B. P., Chong, V. H., & Yong, A. M. (2009). Purple urine bag syndrome. Singapore Medical Journal, 50(5), e193-4.
7. Tang MW. Purple urine bag syndrome in geriatric patients. J Am Geriatr Soc 2006;54:560-1.