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Case Report

Purple Urine Bag Syndrome - Sequence and Interpretation

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Abstract

A purple coloration of contents of a urine bag - the purple urine bag syndrome (PUBS) - is a rare condition, mostly observed in elderly patients with long-term indwelling urinary catheterization. A controversy is ongoing whether PUBS is a harmless incidence or is associated with an imminent risk. We present an unusual observation in a patient with neurogenic bladder, long-term indwelling urinary bladder catheterization, having the urine draining bag replaced once weekly. When connecting the catheter to a new drainage bag the color of the urine in the bag was yellow; the color changed to purple after 4-5 days in a regularly repeating cycle. Occurrence of the purple urine did not parallel any change in the patient's symptoms. The time-dependent emergence of the purple pigment in the drainage bag unrelated to clinical symptoms supports the notion that the purple urine is a genuine "bag syndrome".

Keywords: *Urinary Infection; Purple Urine; Urinary Catheter*

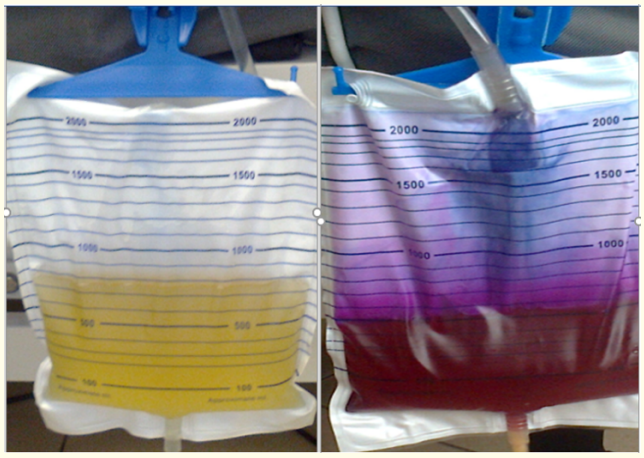
Introduction

A purple discoloration of contents of the urine draining bag - the purple urine bag syndrome (PUBS) - is a rare condition, mostly observed in patients with long-term indwelling urinary catheters. The purple color is conferred to urine by indigo and indirubin. The latter develop as the final step in a chain of events beginning in the intestine where bacteria metabolize tryptophan to indole. After absorption, indole is conjugated in the liver to indoxyl sulfate, then secreted in the urine. Certain bacteria colonizing indwelling urinary tubings are able to metabolize indoxyl sulfate to indoxyl, which is converted by oxidation to indigo and indirubin; the latter confer the purple color to urine [1,2]. The PUBS is considered by some to be a harmless incidence [1,3], but others claim that PUBS herald imminent risks, needing early examination and aggressive antibiotic treatment [4,5]. A clinical case to be presented in the followings permits a fortunate glance at the prime role of the urine drainage bag in the pathophysiology of PUBS. It also lends support to the harmless nature of PUBS when not accompanied by symptoms of infection.

Case Report

A 77-year-old man was in long-term geriatric care having suffered five years previously from trauma to the cervical spine complicated with quadriplegia and neurogenic bladder. He was alert and communicative. The urine was drained through an indwelling bladder catheter. The medications (daily doses) were quetiapine 150 mg, lamotrigine 100 mg, gabapentin 400 mg, simvastatin 20 mg, amlodipine 5 mg and bisacodyl 10 mg. Through May - December 2018 the urine changed color periodically from yellow to purple. We pursued prospectively the clinical context of the PUBS recurrences. The following parameters were recorded daily: the patient's body temperature, sickness behavior [6], bowel movements, color of the urine, the day when the urine drainage bag was changed, adjustments of medications. We noticed a regular sequence of yellow urine following drainage bag replacement and purple urine 4-5 days later (Figure 1). Analysis of a

urine sample taken from the catheter showed pH 7.5, leukocyte esterase +++, nitrite negative. Throughout the study period the patient's medication was not modified, no sickness behavior or fever occurred, the patient did not receive antibiotics, and there was no correlation between bowel movements and PUBS. Results of routine laboratory tests including complete blood count, kidney and hepatic function tests, the C reactive protein were within the normal range. So, PUBS appeared not to be related to any significant infection.



A

December	4	5	6	8	9	10	11	12	13	14	15	16	17	18	19	20	23
U. color	Y /P strata	P	P	Y	Y	Y	Y	Y	P	P		Y	Y	P	P	P	Y
Stools	E		N	N			N				E	N		E	D	D	
Drainage bag change				+							+						+
Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

B

Figure 1: *Right - yellow urine on the day following changing the urine drainage bag; left - purple urine on day 5 (notice that the urine in the tubing at entrance to the collecting bag is clear). B: Urine color in relation to once weekly replacement of the drainage bag. P: Purple Urine, Y: Yellow Urine, G: Green Urine, N: Normal Stool, D: Diarrhea, E: Stool after Enema.*

Discussion

Observations in this patient lend support to facts mostly recognized in the literature. First, PUBS is associated with chronic urinary catheterization [1,2]. Second, PUBS is not in need of a clinical infection [1,3]. Third, the purple urine appears not in the catheter but in the drainage bag [1-5]; a higher bacterial load in the urine favors the appearance of PUBS [4]. The time-dependent emergence of the purple pigment in the drainage bag notice in this patient, as to our knowledge, has not been reported before. Several days were necessary after changing the drainage bag for shifting the urine color from yellow to purple. This might indicate that bacterial colonizers in the patient's urinary tract and catheter, those who produce indigo and indirubin, were in low numbers. Only after the bacteria multiplied on the internal surface of the drainage bag was a critical number reached, to make the reaction visible as the shift in urine color.

Conclusions

The recurring cycle of yellow urine in the newly connected urine bag changing to purple urine several days later supports the understanding that purple urine is a genuine „bag syndrome". Evidently, in the absence of clinical symptoms of infection PUBS is a harmless occurrence.

Conflicts of Interest

The author has no conflict of interest to declare associated with this study.

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