

Isolated Urine Colour Change without Symptoms: A Misleading Presentation Leading to Unnecessary Antibiotic Requests in Women

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Abstract

Background: Urinary tract infections (UTIs) are commonly encountered in outpatient practice and are traditionally diagnosed based on classical urinary symptoms supported by laboratory evidence. However, a growing number of women present with isolated urine colour change without any accompanying urinary or systemic symptoms and with normal urine dipstick findings, yet strongly perceive this change as indicative of UTI and seek antibiotic treatment. The implications of this discrepancy between patient perception and clinical evidence are significant for the problem of inappropriate antibiotic use and antimicrobial resistance. The study was done to evaluate patient perceptions and expectations regarding antibiotic therapy among women presenting with isolated urine colour change, to assess the effectiveness of physician counselling and repeat counselling, and to highlight the potential contribution of this presentation to unnecessary antibiotic use. **Materials and Methods:** This prospective observational study was conducted over one year in the General Medicine outpatient department of Government Medical College, Handwara. Two hundred adult female patients presenting with isolated urine colour change, no UTI-related symptoms, and normal urine dipstick findings were included. After physician evaluation and counselling, antibiotics were not prescribed. Patient perceptions regarding UTI diagnosis and antibiotic necessity were assessed by independent counsellors following physician consultation and again after secondary counselling. **Results:** Despite normal urine examination and absence of symptoms, 76% of patients believed antibiotics should have been prescribed after initial physician consultation. Following secondary counselling, this proportion declined to 44%, indicating partial improvement but persistent misconceptions. Urine colour change emerged as a powerful health-seeking trigger driving inappropriate antibiotic expectations despite objective evidence excluding UTI. **Conclusion:** Isolated urine colour change without symptoms is a misleading presentation that significantly contributes to unnecessary antibiotic expectations among women. Physician reassurance alone is often insufficient. Structured counselling and broader patient education are essential to curb antibiotic misuse and address antimicrobial resistance.

Keywords: Colour of urine; Urinary tract infection; Antibiotic abuse; Patient perception; Antimicrobial resistance; Women's health; Outpatient services.

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INTRODUCTION

Urinary tract infections (UTIs) represent one of the most common bacterial infections affecting women and account for a substantial proportion of outpatient consultations globally.^[1] The burden of UTIs on healthcare systems is significant, with implications for antibiotic use, resistance patterns, and patient quality of life.

Classically, UTIs are diagnosed based on symptoms such as dysuria, urinary frequency, urgency, suprapubic discomfort, flank pain, and fever, in conjunction with laboratory investigations including urinalysis and urine culture.^[2] These clinical features form the cornerstone of diagnostic algorithms used in both primary and secondary care.

Urine dipstick testing, particularly for leukocyte esterase and nitrite, is widely used as a rapid, inexpensive screening tool. Normal dipstick findings substantially reduce the likelihood of UTI, especially in asymptomatic individuals.^[3] Consequently, antibiotic therapy is generally not indicated in

patients lacking both symptoms and laboratory evidence of infection.

However, symptom-based diagnosis alone has limited diagnostic accuracy, and reliance on non-specific or subjective complaints may result in overdiagnosis and unnecessary antibiotic prescribing.^[4]

One such non-specific complaint increasingly encountered in

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outpatient practice is urine colour change.

Urine colour is influenced by multiple non-infectious factors, including hydration status, dietary intake, vitamin supplements, medications, and metabolic conditions. Importantly, urine colour change is not a validated diagnostic marker for UTI.^[5] Despite this, patients frequently interpret urine discoloration as a sign of infection, leading to anxiety, increased healthcare utilization, and antibiotic requests.^[6]

Unnecessary antibiotic use is a major contributor to antimicrobial resistance, adverse drug reactions, and increased healthcare expenditure.^[7] Evidence shows that patient expectations and explicit requests strongly influence physicians' prescribing behaviour, particularly in outpatient and primary care settings.^[8]

Understanding health-seeking behaviour driven by isolated, non-specific symptoms such as urine colour change is therefore essential for effective antimicrobial stewardship. This study examines isolated urine colour change as a misleading presentation that leads to inappropriate antibiotic expectations among women with no objective evidence of UTI.

MATERIALS AND METHODS

Study Design and Setting: This was a prospective observational study conducted over a 12-month period in the General Medicine outpatient department of Government Medical College, Handwara. Many patients were referred from the Department of Obstetrics and Gynaecology for inclusion in the study.

Study Population: A total of 200 adult female patients aged 18–65 years were included. A written informed consent was taken from the participants.

Inclusion Criteria

1. Self-reported urine colour changes perceived by the patient as UTI.
2. Complete absence of urinary or systemic symptoms, including:
 - Dysuria
 - Urinary frequency
 - Urgency
 - Suprapubic discomfort
 - Fever
 - Flank pain
3. Normal urine dipstick findings.

Exclusion Criteria

1. Pregnancy.
2. Antibiotic use within the preceding 14 days.
3. Known chronic kidney disease.
4. Structural abnormalities of the urinary tract.

Clinical and Laboratory Assessment

All participants underwent:

1. Detailed clinical evaluation to exclude UTI-related symptoms.
2. Urine dipstick testing for leukocyte esterase, nitrite, blood, bilirubin, urobilinogen, glucose, ketones, pH, and specific gravity.

All dipstick parameters were within normal limits in all enrolled patients.

Physician Consultation and Counselling

The treating physician:

1. Explained possible non-infectious causes of urine colour change.
2. Reassured patients regarding the absence of UTI based on clinical and laboratory findings.
3. Clearly stated that antibiotics were not indicated.
4. Did not prescribe antibiotics.

Independent Counsellor Assessment

After physician consultation:

1. Patients were referred sequentially to two independent counsellors
2. Counsellors assessed patient perceptions using standardized questions:
 - “Are you convinced that you do not have UTI?”
 - “Do you believe antibiotics should have been prescribed?”

All Patients were referred to the first and then to the second counsellor to document the patient perception and do counselling to those patients who continued to believe antibiotics should have been prescribed, emphasizing:

1. Harms of unnecessary antibiotic use.
2. Antimicrobial resistance.
3. Common benign causes of urine colour variation.

Statistical Analysis: Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS, version 22.0; IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean \pm standard deviation, and categorical variables as frequencies and percentages. Changes in patient perception of the necessity of antibiotics before and after secondary counselling were analysed using the McNemar test. A two-tailed p-value < 0.05 was considered statistically significant.

RESULTS

In our study, 200 female patients aged 18–65 years were included. Baseline characteristics of our study population are shown in [Table 1].

All patients reported yellowish discolouration of urine. Patient perceptions recorded by first counsellor after physician consultation are shown in [Table 2].

Despite the physician's comprehensive counselling and normal laboratory results, more than three-quarters (76%) of patients continued to believe antibiotics were necessary. All patients were referred to a second counsellor to record their perceptions and counselling again. Patient perceptions recorded by the second counsellor after the first counselling session are shown in [Table 3]. Secondary counselling resulted in a 32% absolute reduction in antibiotic expectation, but a substantial proportion of patients remained unconvinced, [Table 4].

Although there was a statistically significant reduction in the proportion of patients who believed antibiotics were required after counselling (76% vs. 44%; McNemar test, $p < 0.001$), but 44% of patients continued to believe antibiotics should have been prescribed, indicating persistent misconceptions despite objective evidence and repeated counselling.

Table 1: Baseline characteristics (N = 200)

Variable	Number (%)
Mean age (years)	33.9
Isolated urine colour change	200 (100%)
Any UTI symptom	0 (0%)
Normal urine dipstick	200 (100%)

Table 2: Patient perception after physician consultation recorded by first Counsellor

Response	Number (%)
Convinced they did not have UTI	48 (24%)
Believed antibiotics should be prescribed	152 (76%)

Table 3: Patient perception recorded by second counsellor

Response	Number (%)
Convinced antibiotics not required	112 (56%)
Still believed antibiotics required	88 (44%)

Table 4: Effect of counselling on antibiotic expectations

Stage of Counselling	% Believing Antibiotics Needed
After physician consultation	76%
After First counselling	44%

DISCUSSION

This study demonstrates that isolated urine colour changes in the absence of symptoms and with normal dipstick findings is a strong but misleading health-seeking trigger among women.^[6]

Despite objective evidence excluding UTI, most patients initially believed antibiotics should have been prescribed, highlighting a significant gap between medical assessment and patient perception.^[8]

These findings align with prior evidence showing that patient requests and expectations exert a powerful influence on prescribing behaviour in outpatient settings.^[8] Even when antibiotics are clinically unwarranted, perceived patient dissatisfaction may pressure clinicians toward inappropriate prescribing.

Normal urine dipstick findings have a high negative predictive value for UTI, particularly in asymptomatic individuals, making antibiotic therapy unjustified in such cases.^[9] Nevertheless, laboratory reassurance alone proved insufficient to correct patient misconceptions in this cohort.

Urine colour changes are commonly attributable to dehydration, dietary factors, vitamin supplementation, and medications, none of which require antibiotic therapy.^[5] However, public understanding of these benign causes appears limited.

Persistent antibiotic demand even after counselling reflects broader gaps in public awareness regarding infection and antimicrobial resistance.^[10] This concern is amplified in settings where antibiotics are easily accessible without prescription, promoting self-medication and resistance.^[11]

Educational interventions targeting both healthcare providers and patients have been shown to reduce inappropriate antibiotic prescribing and dispensing in primary care.^[12] The partial improvement observed after repeat counselling in this study supports the effectiveness—but also the limitations—of individual-level education.

Limitations

1. Single-centre study limits generalizability.
2. Absence of urine culture, though justified by lack of symptoms and normal dipstick.
3. Patient perceptions were assessed qualitatively rather than using validated psychometric scales.
4. No measurement of long-term behavioural outcomes (self-medication, etc.).

CONCLUSION

Isolated urine colour change without symptoms or laboratory evidence of infection is not a urinary tract infection, yet it frequently prompts inappropriate antibiotic expectations among women. Physician reassurance alone is often insufficient to address entrenched misconceptions. Repeated counselling, structured communication strategies, and broader patient education are essential to reduce antibiotic misuse and combat antimicrobial resistance.

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Conflicts of interest

There are no conflicts of interest related to this study.

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