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The Use of Vaginal Oestrogens in the Management of Recurrent Urinary Tract Infections: An Audit

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Abstract **Original Research Article**

Urinary tract infections (UTIs) are a very common presentation to primary care all around the world, and some people suffer from recurrent UTIs, in whom prophylactic treatment could be considered. This article presents findings from an audit in which diagnosis and management of recurrent UTIs is scrutinised against published NICE guidelines, highlighting one main area for improvement that is often overlooked when managing this condition.

Keywords: Urinary tract infection, recurrent, prophylactic antibiotics, vaginal oestrogen.

INTRODUCTION

Urinary tract infection (UTI) is one of the most common conditions to be diagnosed by family medicine physicians throughout the world, both in developed and developing countries (Finley CR *et al.*, 2018). In the UK, approximately 10-20% of women will experience UTI symptoms at some point in their lifetime (UKHSA, 2019), and this condition is typically treated with empirical antibiotic therapy.

According to the National Institute of Clinical Excellence (NICE), the diagnosis of recurrent UTI in adults can be made if there are ⩾2 confirmed UTIs in the preceding 6 months or ⩾3 UTIs in the last 12 months (NICE, 2024) (EAU, 2025). UTI can be confirmed by typical symptoms (e.g. dysuria, urinary frequency, change in smell or colour of urine) and either positive urine dipstick, positive urine culture, or clinical response to antibiotics even in the absence of any investigatory evidence (AMRC, 2024).

Some patients who are diagnosed with recurrent UTIs may require use of long-term prophylactic antibiotics. As with treating any bacterial infection, prescribing antibiotics in this clinical context requires balancing the benefits to the individual against risks of antibiotic resistance. Therefore, to ensure good clinical practice and high standards of antibiotic stewardship, clinicians should accurately diagnose and treat recurrent UTIs.

Other than antibiotic prophylaxis, NICE also recommends considering the use of vaginal oestrogens for those who are postmenopausal and experiencing recurrent UTIs, particularly if behavioural and personal hygiene measures alone have not been effective (NICE, 2024). This recommendation was extended to also consider treatment in perimenopausal women following the guideline update in 2024 (after our audit was conducted).

Aims

This article presents the first cycle of an audit on the diagnosis and management of recurrent UTIs in a primary care practice in the UK, looking into areas of good practice and identifying areas for improvement.

METHODOLOGY

A computer search was performed on the practice electronic patient records in EMIS (Egton Medical Information Systems) to identify patients who received continuous repeat prescriptions of antibiotics for UTI. Search terms for antibiotics were those typically used in recurrent UTI prophylaxis: nitrofurantoin, pivmecillinam or trimethoprim. Exclusion criteria included those under the age of 16 years.

Each identified case was reviewed individually and the following parameters were evaluated in accordance with NICE guidelines (NICE, 2024):

- Treat each episode as acute UTI, arrange investigations (e.g. mid-stream urine - MSU)

- Seek specialist advice on further investigation or management (i.e. refer to urology)
- Consider prescribing vaginal oestrogen (off-label use) in peri- or post-menopausal women if underlying cause has been investigated
- Review antibiotic prophylaxis for recurrent UTI at least every 6 months

Recommended antibiotics as per NICE guidelines (NICE, 2024):

- First-line options
  - Trimethoprim 200 mg single dose when exposed to a trigger, or 100 mg at night.
  - Nitrofurantoin (if eGFR ≥ 45ml/minute) 100 mg single dose when exposed to a trigger, or 50–100 mg at night.
- Second-line options (if the above are unavailable or inappropriate)
  - Amoxicillin 500 mg single dose when exposed to a trigger, or 250 mg at night (off-label use).
  - Cefalexin 500 mg single dose when exposed to a trigger, or 125 mg at night.

*Limitations: Amoxicillin prescriptions were not included in the search as off-label use.

RESULTS

Data was retrieved in October 2022, and 28 patients were identified to be on continuous antibiotic therapy for recurrent UTI (nitrofurantoin, trimethoprim, cefalexin or pivmecillinam). 3 cases were excluded: 1 was a paediatric case, 2 due to technical errors making interpretation of data difficult. Results of the remaining 25 cases are presented below.

Gender	Female 60%, Male 40%
Clear documentation of recurrent UTI episodes (≥2 in 6 months or ≥3 in 12 months)	22/25 (88%)
Urine culture results documented in the notes	20/25 (80%)
Referred to urology for investigation or already investigated / referral offered	19/25 (76%)
Trial of vaginal oestrogen in postmenopausal females	5/9 (55%) 16 cases - not applicable
Antibiotic used	Nitrofurantoin 15/ 25 (60%) Trimethoprim 5/25 (20%) Pivmecillinam 4/25 (16%) Cefalexin 1/25 (4%)

DISCUSSION

Urinary tract infections are commonly seen in primary care all around the world. A proportion of these present as recurrent UTI, defined as ⩾2 confirmed episodes in the preceding 6 months or ⩾3 in the last 12 months (NICE, 2024). It is important that they are diagnosed accurately and treated in accordance with recommended guidelines in order to maintain high standards of antibiotic stewardship. In addition to antibiotics, vaginal oestrogens can be considered for prophylaxis in peri- or post-menopausal patients with a female urinary system (NICE, 2024).

SUMMARY OF FINDINGS

The results of our audit first cycle can be summarised as follows, with an agreed standard of 80% for each criteria, and the ensuing discussion focuses on the main area identified for improvement:

1. Areas of good practice:
   - Documentation of UTI episodes: 88%
   - Documentation of urine MSU results: 80%
   - Correct choice of antibiotic (either first- or second-line): 84%
2. Areas for improvement:
   - Just less than 80% of patients were referred or referral offered for further investigation of UTI to specialist services
   - Only 55% of postmenopausal women were considered for a trial of vaginal oestrogen

Vaginal oestrogens for UTI prophylaxis

It is well-established that UTIs are more common in women than men due to a shorter urethra and closer proximity to the rectum where bacteria originate from (Alrosan S *et al.,* 2023). Postmenopausal and elderly women may have additional risk factors that make recurrent UTI more likely, such as urinary incontinence, atrophic vaginitis due to oestrogen deficiency, increased post-void urine volume, urine catheterisation and functional status deterioration (EAU, 2025). Therefore it is recommended that self-care measures and vaginal oestrogen be considered in this subgroup of patients.

Self-care measures may include use of probiotics (lactobacillus), D-mannose solution/tablets, and cranberry products, although only the latter has undergone a systematic review of use in the elderly population. All of these interventions have overall inconclusive evidence of their benefits and, in the case of cranberry for the elderly, the conclusion was that there was no significant benefit in reducing recurrent UTIs in older people (men and women) when compared with placebo or no treatment during a 6-month treatment period (Williams G *et al.,* 2023).

The rationale for using vaginal oestrogens is the presence of atrophic vaginitis in postmenopausal women. In this condition, lack of oestrogen results in

thinning of the vaginal epithelium, loss of glycogen, a fall in acidity, and interestingly the absence of lactobacilli which are thought to aid in the vaginal resistance to infection and injury (GP Notebook, 2023). Women typically present with irritation and soreness, superficial dyspareunia and sometimes bleeding or discharge.

A short course (up to 3 months) of vaginal oestrogens, with or without systemic hormone replacement therapy (HRT), helps improve atrophic vaginitis symptoms in the majority of cases, with only 10-25% having persistent symptoms after treatment (GP Notebook, 2023). Of course, the benefits need to be balanced against the potential risks, so NICE recommends shared decision-making discussion around the following: severity and frequency of symptoms, risk of complications from recurrent UTIs, potential benefits of treatment, serious side effects being very rare (see below) and mitigated by the fact that topical oestrogen are absorbed locally with minimal amounts entering the bloodstream, the patient's preferred treatment option (cream, gel, ring, pessary). Furthermore, systemic HRT should not be offered specifically to reduce risk of recurrent UTI (NICE, 2024).

Serious risks of HRT include increased the risk of venous thromboembolism, stroke, endometrial cancer (reduced by a progestogen), breast cancer, and ovarian cancer. The endometrial safety of long-term or repeated use of topical vaginal oestrogens is unknown, and therefore treatment should be reviewed at least annually if intended to continue longer than the recommended 3-month trial (NICE, 2024). Less serious side effects of vaginal oestrogens include vaginal bleeding, non-physiological discharge, vaginal irritation, burning, or itching (Perrotta C *et al.*, 2008).

CONCLUSIONS

The results of our audit indicate many aspects of good practice in the diagnosis and management of recurrent UTI. However, the main area identified for improvement and that may be being overlooked on a wider scale is the use of topical vaginal oestrogens as an alternative to prophylactic antibiotics in peri- and post-menopausal women. This is particularly relevant in the case of antibiotic resistance or allergy.

Topical vaginal oestrogens help reverse some physiological changes associated with menopause and age that render women more susceptible to recurrent UTIs, and whilst the serious potential risks of HRT use are well-established, the same cannot be said of long term use of topical vaginal oestrogens.

Therefore, where appropriate, clinicians should consider a short course of vaginal oestrogen as an alternative to antibiotic prophylaxis after full discussion with the patient about the pros and cons of each.

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