A dip into GP management of urinary tract infection in the elderly

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Abstract

Title
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Introduction
The diagnosis of urinary tract infection (UTI) in older people is seen as an area for improvement, with the aim of reducing reliance on dipstick testing and subsequently rationalising the use of antibiotics. As part of the 2016/17 annual General Practice Prescribing Quality Scheme, NHS Kernow Clinical Commissioning Group (CCG) wished to have a primary care focus on prescribing for UTI.

Method
Every practice in Cornwall was asked to review a sample of their older patients (>65 years) who had been prescribed trimethoprim or nitrofurantoin for a UTI in any two week period (minimum of 10 patients, maximum of 30 patients).

Results
Between October 2016 to March 2017, 62 (96.9%) of 64 practices completed this UTI review with 1,146 patients reviewed. Six hundred and twenty-five (54.5%) patients had their urine tested using a dipstick. As regards antibiotic choices, 582 patients (51.8%, range 8 to 90%) were prescribed the first-line choice of nitrofurantoin, and 541 patients (48.2%, range 10 to 92%) were prescribed the second-line choice of trimethoprim. Many practices recorded that the review had prompted them to reconsider their processes and protocols for dealing with urine samples and to ensure that details of symptoms are collected in addition to any sample.

Discussion
This review has identified opportunities for improving the primary care management of UTI in older people in one CCG when comparing current practice with national guidance.

Conclusion
Practices have reflected on and acknowledged specific areas for changing behaviour in UTI management, though maintaining their motivation and impetus will require additional support and facilitation.

Keywords: Urinary tract infection, antibiotics, primary care, elderly.

Introduction

Antibiotic resistance is a global public health issue, and inappropriate use of antibiotics is central to the development of antibiotic resistance. Urinary tract infection (UTI) is the second most common clinical indication for empirical antibiotic treatment in primary and secondary care, and urine samples constitute the largest single category of specimens examined in most medical microbiology laboratories.[1] Clinicians regularly have to make decisions about the prescribing of antibiotics for UTI. Both nationally and internationally, there is considerable evidence of practice variation and deviation from guidelines in the use of diagnostic tests, interpretation of signs or symptoms and initiation of antibiotic treatment for UTI management.[2,3,4]

The diagnosis of UTI is particularly difficult in elderly patients, who are more likely to have asymptomatic bacteriuria as they get older. Older people in long-term care (for example, people in care homes) frequently have unnecessary antibiotic treatment for asymptomatic bacteriuria despite clear evidence of adverse

effects with no compensating clinical benefit. In this older population the prevalence of bacteriuria may be so high that both the accuracy of urine culture and of dipstick testing can vary. For primary care in particular, where dipstick testing has historically been relied upon as an aid to diagnosis of UTI, it is important that factors other than test results are taken into consideration to ensure appropriate management and avoid the unnecessary use of antibiotics, which can lead to a significantly increased risk of clinical adverse events, including *Clostridium difficile* infection or methicillin resistant *Staphylococcus aureus* infection, and the development of antibiotic-resistant UTIs. In addition, dipstick testing is not an effective method for detecting urinary tract infections in catheterised adults. This is because there is no relationship between the level of pyuria and infection in people with indwelling catheters (the presence of the catheter invariably induces pyuria without the presence of infection).

Guidance relevant to primary care management of UTI is available from Public Health England,[5] and elsewhere.[6] The SIGN (Scottish Intercollegiate Guidelines Network) guideline 88 algorithm for diagnosing UTI in older people provides a useful decision aid for prescribers and is used widely across the UK.[7]

As part of the 2016/17 annual General Practice Prescribing Quality Scheme (GPPQS) and, in anticipation of the quality premium expected in 2017/18,[8] NHS Kernow CCG wished to have a primary care focus on prescribing for UTI. Due to increasing concern regarding patients, especially the elderly, developing *E.Coli* bloodstream infections, this National Quality Premium aims to reduce the ratio of trimethoprim to nitrofurantoin prescribing by 10% and the number of patients >70 years prescribed trimethoprim by 10%. Achievement of the Quality Premium should increase the appropriate use of nitrofurantoin as first line choice for the management of UTI in primary care settings, and support a reduction in inappropriate prescribing of trimethoprim which is reported to have a significantly higher rate of non-susceptibility in 'at risk' groups.

In the year prior to this review in NHS Kernow CCG, the local microbiology laboratory was reporting susceptibility of *E. Coli* isolates from urine samples from primary care of 97% for nitrofurantoin, and 64% for trimethoprim. However, it is unclear at what stage of a patient's management for UTI that a sample would be taken – it is assumed that in general this does not occur when the patient first presents to their practice but a sample may be collected if the patient does not respond to first choice empirical therapy.

Method

The aim of the GPPQS was for every practice in Cornwall to review a sample of their older patients (>65 years) who had been prescribed trimethoprim or nitrofurantoin for a UTI in any two week period (minimum of 10 patients, maximum of 30 patients). Practices had between October 2016 and March 2017 to complete the review. Information was gathered from the practice clinical system about the diagnosis and management of these patients to find out whether the prescribing was in line with the SIGN 88 algorithm. The search strategy involved identifying patients aged over 65 years prescribed trimethoprim or nitrofurantoin over the most recent two weeks. Relevant details for a minimum of 10, and a maximum of 30 patients were recorded in a data collection form. Summarised results were provided to the GP prescribing lead for the practice with the expectation that results be discussed with all prescribers at a practice meeting, with the aim of reflecting on the results and agreeing key action points to improve the future diagnosis and management of UTI in older patients. The purpose of the audit was to capture practice-specific data on clinical indicators that have a proven link to outcomes, and encourage reflection and behaviour change within the practice.

Results

Over October 2016 to March 2017, 62 (96.9%) of 64 practices completed this UTI review with 1,146 patients reviewed (range 8 to 32 per practice), of which 146 patients (12.7%) were living in a care home. Nine hundred and two (78.7%) patients had their UTI symptoms recorded in their notes, though the inter-practice rate of recording varied from 100% to 30%, with 21 practices recording symptoms in less than three-quarters of relevant patients. Six hundred and twenty-five (54.5%) patients had their urine tested using a dipstick, and 622 (54.3%) patients had their urine sent for culture. As regards antibiotic choices, 582 patients (51.8%, range by practice from 8 to 90%) were prescribed the first line choice of nitrofurantoin, and 541 patients (48.2%, range by practice from 10 to 92%) were prescribed the second line choice of trimethoprim. One practice (23 patients) did not record which antibiotic was chosen. Two hundred and seven (18%) patients were prescribed long term UTI antibiotic prophylaxis, whilst 274 (23.9%) patients had their antibiotic prescribed via a telephone consultation.

The free text comments entered by the lead GP described the key points from subsequent discussions in practice. The themes described in the practice actions plans were:

- Some practices recognised that they were still prescribing more trimethoprim (a second line choice) rather than the first line choice of nitrofurantoin.
- A few practices noted that they were not prescribing shorter 3 day courses for female patients, as recommended in local guidelines.
- Many practices acknowledged that dipstick testing was being used alone in the decision to prescribe antibiotics but they knew this should not be done routinely in this age group (>65 years), and discussions noted trying to reduce routine dipstick testing.

Some practices noted that whilst face-to-face assessments were recommended in the NICE Quality Standard this is not always practical but they aimed to increase the numbers of these assessments in the future. Some practices were surprised by the number of patients identified taking prophylactic antibiotics and that patients had not been reviewed within the last six months.

Many practices recorded that the review had prompted them to reconsider their processes and protocols for dealing with urine samples and to ensure that details of symptoms are collected as well as the sample. Some practices said they would introduce a form or checklist for use with care homes.

At the time of the audit, 36 practices reported that the CPD module on UTI via the TARGET toolkit had not been completed by any of the GPs, 4 did not answer this question and for the other 22 practices the indication was that at least one member of the practice team (e.g. GP prescribing lead, other GP, or nurse practitioner) had completed it.

Discussion

This review has identified opportunities for improving the primary care management of UTI in older people in one CCG when comparing current practice with national guidance,[9] as reported by others both nationally and internationally.[10] At the time of the review, trimethoprim had only recently moved from first to second line choice for UTI in the local antibiotic guidelines, so it is not surprising that on average many practices were still prescribing trimethoprim (for a mean of 48.2% patients) though eight practices used trimethoprim in less than 30% of their patient.

Some of the reflection notes made by the lead GP alluded to a recognition that trimethoprim was still being prescribed as first choice due to familiarity and habit, though prescribing was also justified in those patients with renal impairment. A study into antibiotic choices in English primary care for a slightly earlier time period than our review reported that of those antibiotic prescriptions linked to a code for UTI, the proportions of prescriptions of trimethoprim was 50.0% and for nitrofurantoin was 26.3%, though the authors comment that prescriptions for first-line UTI treatment (nitrofurantoin, trimethoprim) were poorly documented to a diagnostic code. Others have shown that historically trimethoprim was consistently the most commonly prescribed antibiotic for community acquired UTI, accounting for about 50% of all prescriptions in older patients.[11]

NHS England measure	Target	12 months to October 2016	12 months to October 2017
Antibacterial items per STARPU	1.161	1.053	1.022
Co-amoxiclav, cephalosporins and quinolones as percentage of all antibiotics	≤ 10%	10%	9.89%
NHS England measure	**Target**	**12 months to May 2016**	**12 months to May 2017**
Trimethoprim: Nitrofurantoin ratio	1.504	1.671	0.863

Table 1: CCG Improvement Assessment Framework AMR indicator

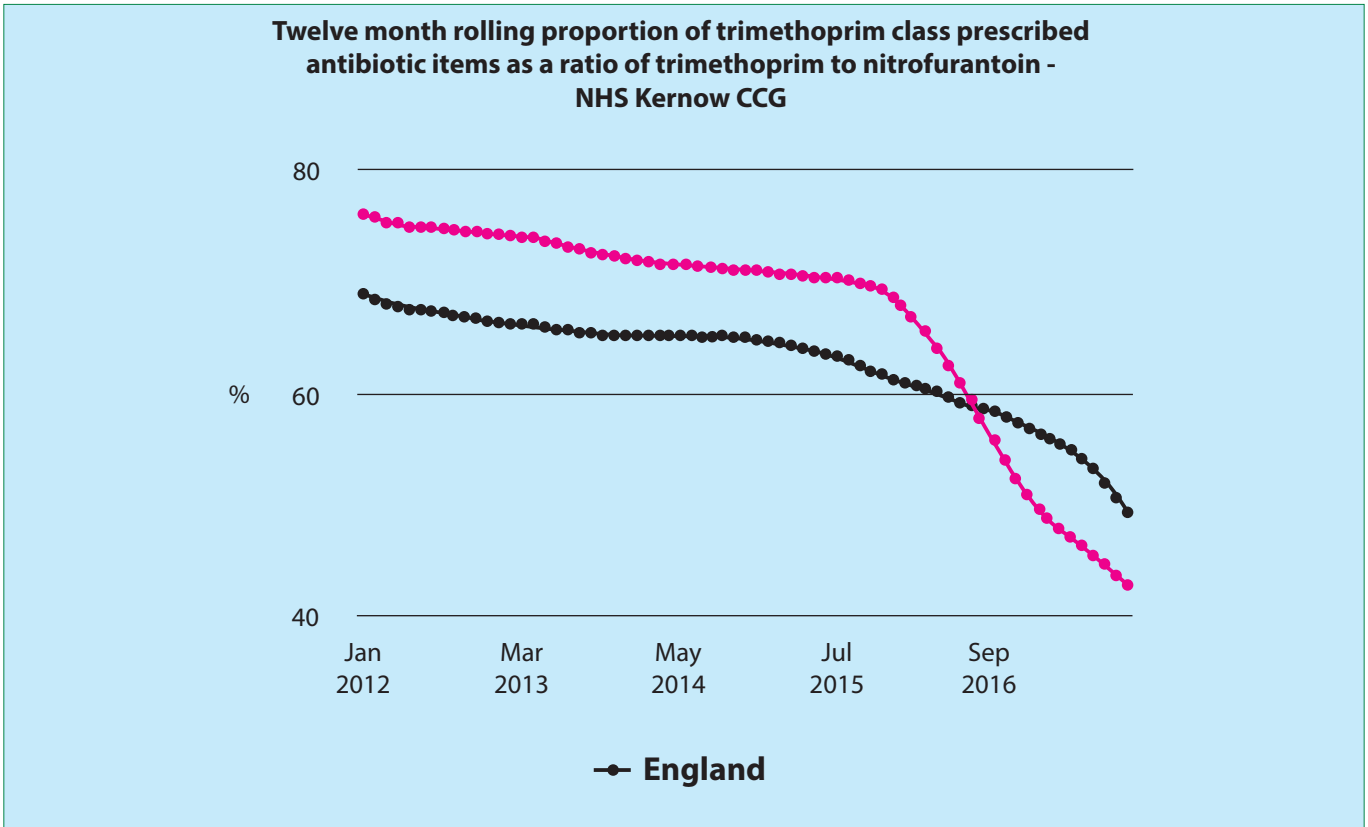

Figure 1: Trimethoprim to nitrofurantoin ratio

Just over half the patients had either urine culture or urine dipstick testing undertaken. Though there is an emphasis on avoidance of relying solely on dipstick testing in older patients in particular, we do not know if this extent of sending off cultures in this age group is appropriate or not. A 2012 survey in the West Midlands gathered information on policies used within the practice for urine sampling for microbiological examination, and found only 50% of GPs reported having a practice policy for urine sampling.[12] Some of our practices recognised the need to better manage how UTI is diagnosed and managed within a care home setting, and this has now become a focus for work across the whole of the CCG.[13] There had been some uptake of the TARGET toolkit UTI module by the end of the review period though, as others have found, time, workload and competing priorities of other initiatives are possible barriers to GP staff not fully utilising this resource.[14]

Others have reported success with a broader UTI management stewardship initiative, leading to a dramatic reduction in inappropriate prescribing for UTIs, and a subsequent drop in local resistance rates in UTI organisms.[15] We did observe an improvement in the NHS Kernow CCG position for relevant antimicrobial resistance (AMR) prescribing measures (Table 1) prior, and subsequent to, the review, though there were many influences - both local and national - affecting GP antibiotic prescribing at the same time as our review.

More recently, the Public Health England Antimicrobial Resistance local indicators[16] which express the NHS England measure differently, show that NHS Kernow CCG had a value for a twelve month rolling proportion of trimethoprim as a ratio of trimethoprim to nitrofurantoin of 62.5% in May 2016 falling down to 42.6% by September 2017. Values for England were 59.7% down to 49.3% respectively (see Figure 1).

This continued fall in our CCG may be because audit and reflection are believed to contribute to change in behaviour, though a relevant topical news story in the medical literature may facilitate and contribute to the necessary ongoing change.[17]

Limitations of this review include reliance on GPs reporting back to us on how they perceived the quality of their management; we did not look at whether the chosen empirical antibiotic was the correct one in those instances where a culture had been sent off, nor if the patient's renal function influenced the antibiotic choice, nor did we examine the duration of antibiotic treatment. We accept that the reported percentage of patients whose urine was dipstick tested (54.5%) includes in the denominator those receiving long term antibiotic prophylaxis as we were unable to separate these patients out from our results, however we suspect that dipstick testing would still have occurred in many of these patients. We have not yet been able to ascertain if practices recognise that a urinalysis result is irrelevant to their clinical assessment and is therefore pointless. Results of this review have been shared with each GP practice, and a continuing focus on this topic is aligned with the educational intervention occurring in care homes.[13]

Conclusion

We report on a review into GP management of UTI in the elderly in one CCG and, as others have noted in other primary care studies, there was scope for improvement both in terms of diagnosis and treatment. The key messages from the review were a reduction in the reliance on use of dipstick testing in this age group (diagnosis should be based on a full clinical assessment, including vital signs), and a move away from trimethoprim as default first line antibiotic of choice to nitrofurantoin. Certainly the latter element of this review can be measured through prescribing data, whereas identifying any actual improvement in the practices' approach to UTI diagnosis will require further audit.

Declaration of interests

The authors have no declarations of interest to make.

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