Urinary tract infection in hospitalized elderly patients in the United Kingdom: the importance of making an accurate diagnosis in the post-broad-spectrum antibiotic era

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The increasing prevalence of Clostridium difficile infection (CDI) has prompted many hospitals in the UK to recommend the use of narrow-spectrum antibiotics targeted at the likely bacteria at the clinical site of infection instead of broad-spectrum antibiotics. An underpinning requirement of such a strategy is the need to make an accurate diagnosis. In elderly patients, diagnosis of urinary tract infection can be challenging due to the frequent presence of respiratory signs and difficulties in the collection of urine specimens. This leads to the use of broad-spectrum antibiotics. Clinicians should attempt to make an accurate diagnosis of respiratory and urinary infections, as this will be crucial in the choice of the appropriate narrow-spectrum antibiotics.

Keywords: UTIs, antibiotics, C. difficile, CDI

Introduction

Some principles do not change in medicine. One such principle is the need to make an accurate diagnosis. An accurate diagnosis is the basis for planning the management and prognosis of an illness. In this article, we discuss the importance of making an accurate diagnosis and using appropriate narrow-spectrum antibiotics in an effort to prevent and control healthcare-associated infections such as Clostridium difficile infection (CDI) in the UK.

Misleading signs in the elderly

Urinary tract infection (UTI) and lower respiratory tract infection (LRTI) are common infections in the elderly.1, 2 Many elderly patients are presumptively diagnosed as having LRTI or UTI or even both but these diagnoses are never confirmed. A reason for this is that many elderly patients are often confused at the time of presentation and are unable to provide a definite clinical history suggestive of LRTI or UTI.3 In such circumstances, the admitting physician is solely dependent on clinical examination and investigations. Routine investigations recommended include urine analysis and chest X-ray (CXR).4 Although CXR is performed on nearly all elderly patients seen in emergency departments in the UK, urine examination results are frequently not available at the time of admission, usually due to the failure to obtain a urine specimen for analysis.

Elderly confused patients without obvious symptoms of respiratory infection such as cough, breathlessness or pleuritic chest pain, but with signs of sepsis (fever >37.5°C), basal crepitations, raised white cell count and a normal CXR are diagnosed as having LRTI. It is a commonly held view that clinical signs such as basal crepitations precede radiological changes and are suggestive of LRTI. As a result of this diagnosis, the patients are treated with antibiotics that are active against lower respiratory pathogens such as Streptococcus pneumoniae and Haemophilus influenzae. But do these patients have LRTI?

Over a decade ago, Barkham et al.5 showed that in 104 patients aged over 50 years with subsequently confirmed UTI (Gram-negative bacteraemia, significant bacteriuria, pyuria), only 45 (43%) had an admitting diagnosis of UTI, 26 (27%) were diagnosed as having chest infection and a further 47 had other diagnoses including non-infective illness. Some of these patients had more than one diagnosis. The failure to make a correct initial diagnosis was particularly notable in the elderly (>70 years) where only 27 of the 65 patients were correctly diagnosed as having UTI at the time of admission. Chest infection was diagnosed significantly more frequently in the >70 years age group. This was not surprising because confusion (15/49, 31%), cough (14/49, 29%) and dyspnoea (13/49, 27%) were more common than new urinary symptoms (20%). Furthermore, the study reported that in the older patients less than half the urines reached the laboratory on the day of admission and even where the results of urine microscopy were available, frequently

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Role of urine examination

Diagnosis of UTI in confused elderly patients can be difficult because of the non-specificity and frequently misleading symptoms and signs. Diagnosis of UTI in these patients is primarily based on examination of urine. In non-catheterized patients, a dipstick can be used to test for the presence of nitrites and leukocyte esterase as surrogate markers for UTI. Absence of nitrites and leukocyte esterase has >90% reliability in ruling out UTI. While detection of nitrites in the urine of asymptomatic non-catheterized patients may prompt initiation of treatment, the presence of leukocyte esterase is less reliable as an indicator of UTI (positive predictive value <50%). In catheterized patients, use of dipsticks is not recommended. If UTI is suspected, urines should be sent to the laboratory both for confirmation and antibiotic susceptibility tests.

In elderly patients, collection and examination of urine is a necessary adjunct to making an accurate clinical diagnosis of UTI presenting with signs of sepsis even if they have respiratory symptoms and signs, especially in the absence of new changes on CXR.

However, obtaining urine specimens in elderly patients can be challenging, as they are often immobile, confused and incontinent. Another reason for not obtaining urine specimens is failure of communications either between the doctor and the nurse or between nursing teams in the emergency department and the wards. In some patients, urine specimens are collected long after the patient has been commenced on antibiotics, which may result in negative urine cultures even though the patients may have had UTI.

Given the difficulties in obtaining a specimen from confused or incontinent patients, we think there is a strong case for diagnostic ‘in–out’ catheterization after using a bladder ultrasound scanner if possible. The benefits of making an accurate diagnosis are likely to outweigh any risk from the procedure.

CDI and broad-spectrum antibiotics

Until recently, it was common to use broad-spectrum antibiotics such as cephalosporins or newer fluoroquinolones for LRTI. These antibiotics are also generally efficacious for UTI. So an accurate diagnosis of site of infection was not perceived to be important. However, with the increasing prevalence of CDI and the emergence of antibiotic-resistant organisms, we can no longer afford to be imprecise in our diagnosis or with the choice of the antibiotics. The most important risk factor for CDI is the use of broad-spectrum antibiotics. It is small wonder, then, that the Department of Health in England has recently issued ‘best practice’ guidelines for antibiotic prescribing. These guidelines advise against the use of broad-spectrum antibiotics such as cephalosporins, fluoroquinolones and broad-spectrum penicillin including amoxicillin due to the risk of development of CDI. Instead, they recommend the use of narrow-spectrum antibiotics such as benzyl penicillin and trimethoprim.

There is an urgent need for guidance from professional societies to review guidelines recommending broad-spectrum antibiotics in light of the increased risk of CDI. Many hospitals in the UK have either recently revised or are in the process of revising their antibiotic guidelines to promote the use of narrow-spectrum antibiotics to prevent CDI. However, if narrow-spectrum antibiotics are to be used, every effort should be taken to make an accurate diagnosis, especially differentiation of urinary from respiratory infection in the elderly.

In this post broad-spectrum antibiotic era, an accurate diagnosis of the clinical site of infection is not a luxury but a necessity.

Transparency declarations

None to declare.

References