Nosocomial urinary tract infections: many unresolved questions

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Urinary tract infections (UTI) are the most common nosocomial infections in both acute-care hospitals and long-term-care facilities. Results of various European national prevalence studies show that they account for 23–49% of all nosocomial infections [1]. The costs of prevention, detection and treatment of UTIs significantly affect a country’s health-care budget so that even a small decrease in the UTI rate would have important economic implications.

However, information about the epidemiology of UTI, as well as studies investigating the best practice for prevention, detection and treatment of these infections is still quite limited. A Medline scan of the last 10 years, with the search term ‘nosocomial urinary tract infection’, produced only 279 articles, whereas the terms ‘nosocomial pneumonia’ or ‘nosocomial sepsis’ produced 1092 and 788 articles, respectively.

This issue of Clinical Microbiology and Infection includes three articles that highlight different aspects of the problem of nosocomial UTIs in European countries. Two articles report the results of a study undertaken by the European Study Group on Nosocomial Infections (ESGNI) [2,3].

The first article discusses microbiology workload, etiology and antimicrobial susceptibility. According to the information obtained in a questionnaire from 228 hospitals in 29 European countries, the number of urine samples obtained for culturing was 324 per 1000 admissions in 1999. However, the cut-off values of colony-forming units (CFU) used for evaluating a urine sample as ‘potentially significant’ varied from institution to institution. A point prevalence design was also used to describe the situation on the study day in February 2000 from the perspective of the microbiology laboratory: 5152 urine samples were analysed, 18.5% being positive (>10^5 CFU/mL). The micro-organisms isolated from significant nosocomially acquired bacteriuria episodes and the antibiotic susceptibility profiles are presented regardless of the laboratory methods used. For the most frequent pathogen, Escherichia coli (35.6%), 54.8% of isolates were resistant to ampicillin, 28% to cotrimoxazole and 9% to ciprofloxacin.

The second article reports on the incidence, clinical characteristics and outcome of nosocomial UTIs. One hundred and forty-one hospitals from 25 European countries participated; data from 298 episodes were analysed and evaluated with regard to the use of catheters, underlying diseases and adequacy of treatment. Furthermore, information concerning institutional bladder catheter guidelines was recorded. It was found that 62.8% of nosocomial UTIs were catheter associated. An closed drainage system was used in only 78.5% of catheterized patients, and a silver-coated catheter in 2.2%. Of the infected patients, 75.5% received antibiotics over 7-day periods, on average.

The third article presents results from a microbiology laboratory in Norway [4]. Data on etiology and susceptibility of UTI with patients in and outside hospitals and nursing homes are given for a period of 34 months (1997–99). A total of 32,350 samples were analysed retrospectively. Escherichia coli was the most frequent organism found in hospitals (56.7%), but only 24.5% were resistant to ampicillin and 18% to trimethoprim/sulfamethoxazole (TMX). Quinolones were not tested, because they are not recommended for use in Norway.

These three reports illustrate a number of important points regarding nosocomial UTIs. The first is that such infections are probably more common than most health-care workers realize. We need more data about the actual presence of UTIs and their trends.

As early as 1980, 20 years ago, a European multicenter prevalence survey of UTIs was carried out [5]. This study of 3899 medical patients in 169 wards was performed simultaneously in eight countries in northern Europe, including England, the Netherlands, Germany and Austria. A point prevalence of nosocomial UTIs of 6.5% was noted.

It is difficult, however, to describe the situation accurately and to compare properly the infection rates found in different studies. The definition of nosocomial UTI varies between hospitals and countries, as is apparent from the ESGNI study. Prospective studies for establishing a specific quantitative level to indicate infection have not yet been carried out. Therefore, a consensus throughout Europe for the interpretation of urine cultures is urgently required.

The same is true of the indication for urine cultures. On the one hand, the majority of catheter-associated infections are missed and symptomatic infections are detected, if culturing is performed, only when symptoms for UTI are already available. In particular, catheter-associated UTI are rarely symptomatic, more than 90% being asymptomatic [6]. Thus, routine screening is necessary in order to acquire accurate epidemiological data for UTI.
Most clinicians do not recommend treatment of asymptomatic bacteriuria in catheterized patients unless the patient is at high risk due to complications, such as bacteraemia or renal infection. For most patients with temporary catheters this condition is transient and resolves itself spontaneously without any clinical complications. Routine culturing for bacteria in the urine of catheterized patients, in order to identify asymptomatic bacteriuria, is therefore not recommended, even at the time of catheter removal [7].

An overview of the most frequent organisms, including their resistance situation, is required for the treatment of complicated UTIs. Asymptomatic catheter-associated bacteriuria especially is responsible for creating a huge reservoir of antibiotic-resistant organisms in the hospital setting, particularly in intensive care units. Transmission of these organisms has been demonstrated by molecular typing investigations [8]. While the resistance of those micro-organisms causing UTI was not mentioned at all in the European study published by Jepsen et al. in 1982 [5], the problem is now recognized to be a high priority, and the resistance patterns of UTI pathogens are a serious cause for concern, particularly in southern and eastern Europe. A certain number of urine cultures should, therefore, be undertaken to guarantee sufficient information about the susceptibility of UTI pathogens.

Clear guidelines for the implementation of a consistent program with respect to urine cultures would clearly be helpful to most clinicians [9].

Some questions concerning the prevention of UTIs remain unresolved. The single most effective preventive measure is probably to avoid the use of indwelling catheters whenever possible. Jain et al. found, in a North American hospital, that the placement of urinary catheters was unjustified in 21% of cases, and that continued catheterization was unjustified in 47% [10]. Similar results for Europe have been found in the study presented in this issue. Unfortunately, the criteria for considering catheterization unjustified, and assessment of the need for continued catheter use are not described in detail.

The last significant advance in the prevention of catheter-related UTI, i.e. the implementation of closed drainage systems, took place in the 1960s. It is therefore astonishing that in this European study, in the year 2000, more than 20% of catheterized patients were being treated without the benefit of a closed drainage system. On the other hand, 2.2% of the patients did have a silver-coated catheter. The silver alloy, hydrogel-coated latex catheter would appear to prevent UTI and may be worth the extra cost [11], but further investigations are needed to establish a definite advantage.

I am certain that the three reports presented in this issue will stimulate further activity toward establishing current and evidence-based guidelines for preventing, diagnosing and treating nosocomial UTIs.

REFERENCES