



Incidence of antibiotics resistance among uropathogens in Omani children presenting with a single episode of urinary tract infection



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Summary Urinary tract infection (UTI) is one of the most common community-acquired infections. Different organisms can be the cause of UTI in children, with resistance to antibiotics becoming a significant problem in the choice of treatment. Worldwide studies have documented the prevalence of uropathogens in different countries. However, there is no previous study documenting the incidence of different uropathogens in Oman. We aim to report the most common uropathogens and their antibiotic sensitivity patterns in children presenting with documented, single episode UTI at a tertiary hospital in Oman. A retrospective analysis of all Omani children below 14 years who presented with a case of first documented UTI to SQUH between September 2008 and August 2012 was conducted. Data were obtained from the patients' electronic records in the hospital information system. Data were then analyzed using SSPS (Statistical Package for Social Sciences program, Version 20, IBM, Chicago, IL, USA). In the retrospective review of all urine cultures, 438 positive urine cultures were identified. Out of those, 208 (47.5%) belonged to children with their first episode of UTI. Thirty-three patients were excluded and 75 patients were

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included in the final analysis. *Escherichia coli* was the most frequently encountered uropathogen in our cohort (69%), followed by *Klebsiella pneumoniae* infection (17%). Nearly half (46.6%) of these two common organisms were resistant to Cotrimoxazole, while 31% of them were resistant to Augmentin. Twenty-four percent of the *E. coli* and *K. pneumoniae* strains were resistant to Cefuroxime, and only 10% were resistant to nitrofurantoin. Both Augmentin and Cotrimoxazole should not be the first line antibiotics to treat UTI.

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Introduction

Urinary tract infection (UTI) is a common cause of fever and one of the most common community-acquired infections. Due to possible complications of upper UTI (pyelonephritis), such as renal scarring, hypertension, and end-stage renal disease, treatment with proper antibiotics is a crucial step of management. Although children with pyelonephritis tend to have a fever and more systemic features, it is often difficult to distinguish cystitis from pyelonephritis UTIs based on clinical presentation, particularly in children younger than two years of age [1].

Different organisms can be the cause of UTIs in children, with resistance to antibiotics becoming a significant problem in the choice of treatment. Frequent use of wide-spectrum antibiotics may change the intestinal flora, and as a consequence, induce bacterial resistance. Regular surveillance of local uropathogens, as well as their antibiotic susceptibility, is considered to be useful in guiding empirical therapy, as the prevalence of uropathogens and their features may vary according to the time and geographical area [2]. The American Academy of Pediatrics, the Royal College of Physicians of London and the National Guideline Clearing house recommend empirical and precocious treatment of UTIs based on the susceptibility standard to the antibiotics that are habitually utilized, with the objective of reducing the risks of pyelonephritic scarring [3].

Worldwide studies have documented the prevalence of uropathogens in different countries [4,5]. However, no previous study has documented the incidence of different uropathogens in Oman. In this study, we aim to report the most common uropathogens and their antibiotic sensitivity pattern in children presenting with a documented, single episode UTI at a tertiary hospital in Oman.

In addition, we aim to describe the clinical presentation and laboratory evaluation of these children.

Patients and methods

A retrospective analysis was performed on the records of all Omani children with their first documented UTI who presented to Sultan Qaboos University Hospital (SQUH) over a period of 4 years from September 2008 to August 2012. SQUH is one of two main tertiary hospitals in Oman, with a total bed capacity of 530 beds.

Data were obtained from the patients' electronic records in the hospital information system. All patients who were 14 years or younger and had positive urine cultures were evaluated for inclusion in the study. Exclusion criteria included: patients with recurrent UTIs, neurological impairment (bed ridden patients), immune deficiencies and hematological malignancies, as these patients might have recurrent UTIs or recurrent exposure to antibiotics, which may affect antibiotic resistance patterns. Patients with deficient data were also excluded from the study.

The data collected included age, gender, and clinical presentation, such as fever, chills, decreased activity, nausea and/or vomiting, abdominal pain, poor feeding, constipation, frequency of urination, dysuria, flank pain, secondary enuresis, gross hematuria and foul-smelling urine. Other data collected included the method of urine collection and results of urine analysis, including nitrites, pyuria and hematuria, in addition to the results of urine culture and antibiotic sensitivity tests. Laboratory parameters included the presence of leukocytosis, neutrophilia, and high CRP. Pyuria was defined as ≥ 5 WBC/high power field (HPF) and classified as mild (5–20), moderate

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