

MANAGEMENT OF URINARY TRACT INFECTIONS IN ELDERLY AT THE REHABILITATION HOSPITAL KARIN GRECH

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ABSTRACT

OBJECTIVE To assess the percentage of patients suffering from urinary tract infections (UTIs) who were treated at the Rehabilitation Hospital Karin Grech (RHKG) and to evaluate treatment choices used to manage UTIs at the same hospital during a one-year period.

METHOD A retrospective and current study were carried out to collect information about patients who were diagnosed with UTIs namely age, gender, medical history, medications and presence of a catheter. This information was obtained from patient profiles in each of a total of 9 wards in the hospital. Analysis of data was carried out using Microsoft office Excel® 2010 and SPSS® version 20.

KEY FINDINGS Out of 165 UTI patients, 67% were female (n=111) and 33% were male (n=54). Thirty-seven percent of the patients were diabetic. Ninety patients had a catheter prior to the period of infection and an association between catheterisation and type and number of UTI pathogens was reported. Presence of a catheter increased the chance of being affected by two or three different types of UTI pathogens which are more resistant than pathogens which were contracted by non-catheterised UTI patients in one episode. The majority of UTI cases at RHKG were treated with nitrofurantoin (41.8%), the first line agent as mentioned in hospital guidelines, followed by ciprofloxacin and co-amoxiclav at 27.3% and 20.0% respectively. Out of the 41.8% of patients who were treated with nitrofurantoin, 30.4% had an estimated glomerular filtration rate (eGFR) and/or urinary pH unsuitable for nitrofurantoin use.

CONCLUSION A prevalence of UTIs in hospitalised patients at RHKG of 11% was identified. Catheterisation increased risk of UTI and presented with a higher number of different pathogens. Nitrofurantoin was the main antibacterial used in the management of UTIs.

KEYWORDS urinary tract infections in adults, diabetes, catheterisation, antibacterials

INTRODUCTION

Urinary tract infections (UTIs) are the most common nosocomial infections¹ and reach up to 40% of the total hospital-acquired infections.² Worldwide, around 150 million persons are diagnosed with UTIs per annum, costing the global economy approximately 6 billion US dollars.¹ UTIs are exacerbated in elderly people in communities and long term health care centres³ due to decreased functional capacity and increased use of medications.⁴

The aims of the study were to identify the occurrence of UTIs in patients at RHKG, evaluate treatment choices adopted in the management of UTIs and to identify correlation factors with diabetes and catheterisation.

METHOD

The study was approved by the University Research Ethics Committee. An extensive literature review on the management of urinary tract infections was undertaken. A retrospective and current study of inpatients who were diagnosed with UTIs was carried out in each of a total of 9 wards in the hospital during the one-year study period. In the first retrospective stage, the information was obtained from patient profiles which were included in the archive of the pharmacy department. In the second stage, patient information was obtained whenever new cases of UTIs were recorded at RHKG. The study design was based on classifying patients into groups according to type and number of microorganisms, antibacterial therapy which is used to treat UTI patients, co-morbidities (diabetes mellitus) and whether the patient is catheterised or not.

The research setting was the RHKG, a 280-bed hospital targeted for the treatment and rehabilitation of patients who are sixteen years of age and older, with the majority of patients being over sixty years. Patients are referred from the acute hospital or their home.



Out of 96 patients who were treated with second line antibiotics, the reasons behind prescribing second line treatment were renal impairment, urinary pH and sensitivity.

Analysis of data was carried out using Microsoft office Excel® 2010 and SPSS® version 20. The chi-squared test of association was applied to study associations between age and gender, catheterised and non-catheterised patients, number and types of pathogens and recurrence of UTIs, diabetes and pathogen types.

RESULTS

During the study period, there were a total of 1564 admissions of which 61.76% were female patients. The mean age of patients and length of stay were 79.7 years and

46.7 days respectively. Eleven percent of the patients (n=165) suffered from UTIs during their hospitalisation period. Most of the patients complained of urgency, frequency, burning sensation during urination, abdominal or loin pain, discolouration of urine and fever.

Out of the 165 UTI patients, 67% were female (n=111) and 33% were male (n=54) (Figure 1). The number of females suffering from UTIs was double that of males. The highest proportion of male patients suffering from a UTI fell in the 71-80 age range, while the majority of female patients with a UTI fell in the 81-90 age range.

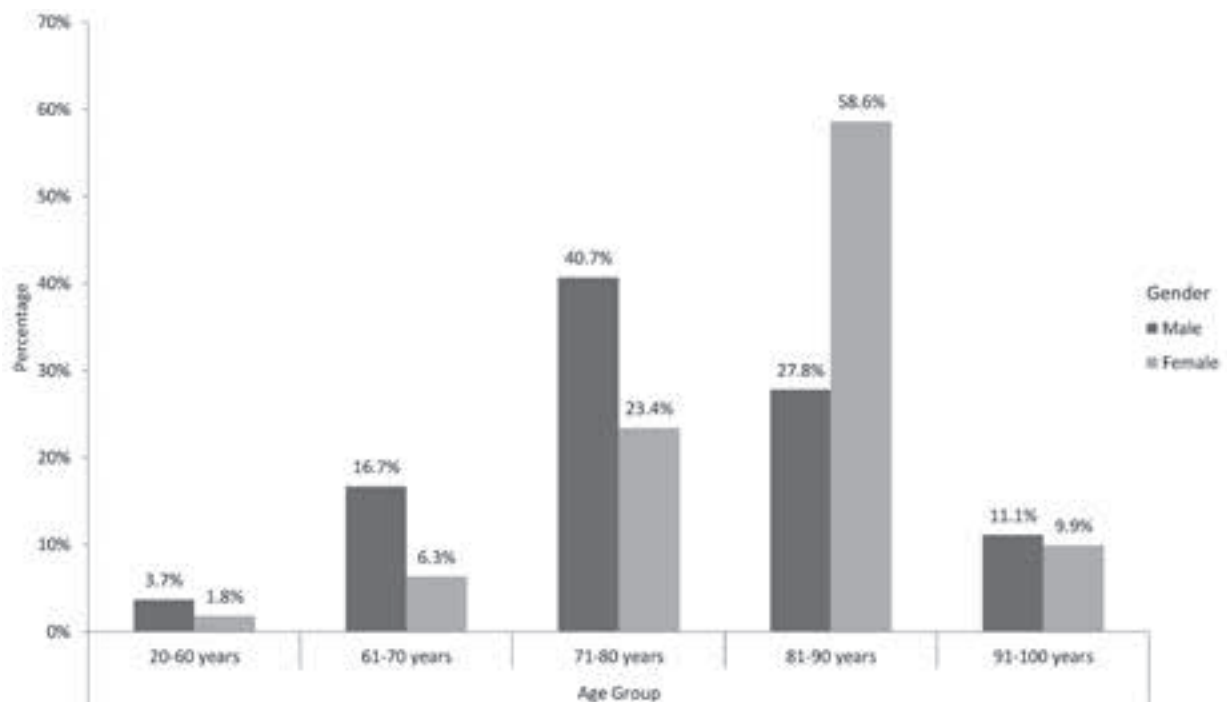


Figure 1: Gender and Age Groups (N=165)

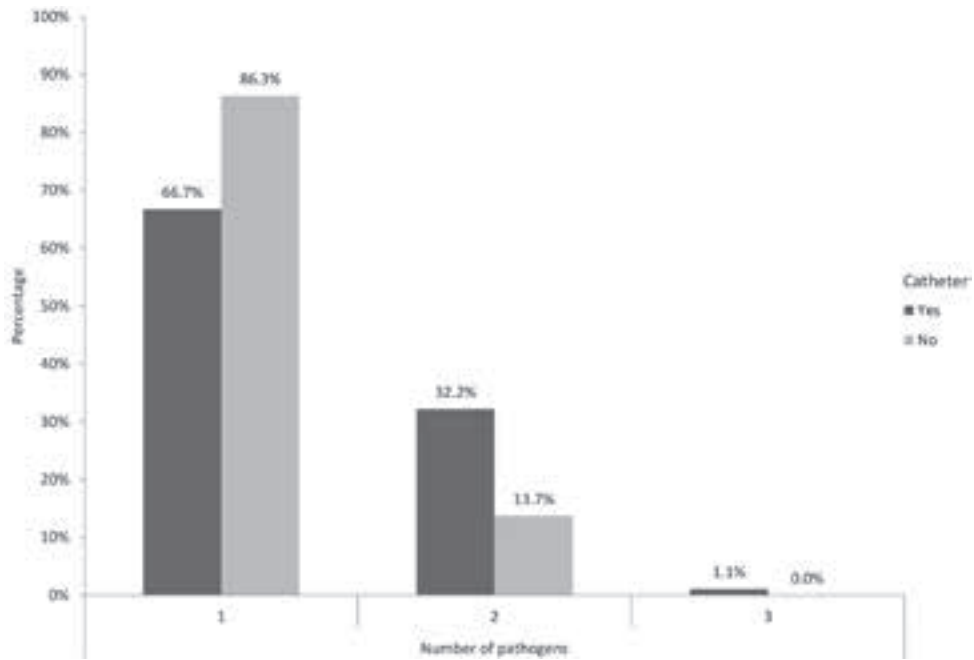


Figure 2: Catheterisation and Number of UTI Pathogens (N=165)

Out of the 165 patients, 54.5% (n=90) had a catheter prior to the infection period. Patients with a catheter are more likely to have more types of pathogens such as *Serratia marcescens* and *Providencia stuarti* than the pathogens that appear in non-catheterised patients. These new pathogens are also more resistant than the pathogens in non-catheterised patients, for instance, *E. coli* ESBL and *Staphylococcus aureus* MRSA. Catheterised patients have almost double the number of pathogens than non-catheterised patients ($\chi^2 = 40.597, v = 19, p = 0.003$).

Figure 2 indicates the number of pathogens responsible for UTIs per patient in terms of presence or absence of a catheter. Patients without a catheter are more likely to have just one type of pathogen when compared to catheterised patients (86.3% as opposed to 66.7%). Catheterised patients have a higher chance of having two or three types of pathogens at the same time when compared to patients having no catheter (33.3% as opposed to 13.7%). The presence of a catheter leads to an increase in the number of pathogens in one episode of UTI ($\chi^2 = 8.574, v = 2, p = 0.014$).

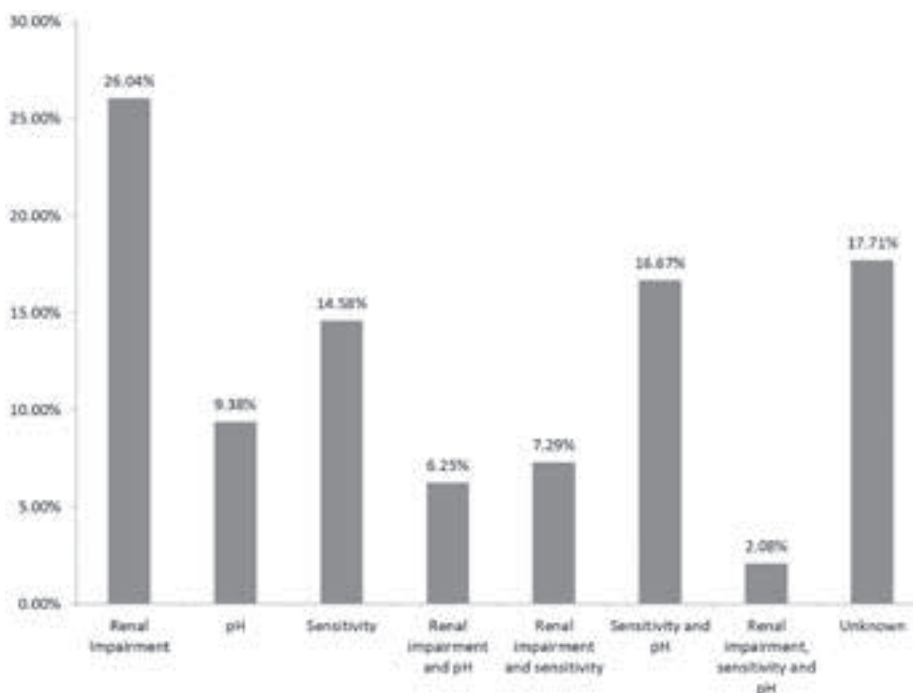


Figure 3: Reasons of Prescribing the Second Line Antibiotics (n=96)



The majority of UTI cases were treated with nitrofurantoin, which amounted to 41.8%. This was followed by ciprofloxacin and co-amoxiclav at 27.3% and 20.0% respectively. Out of 96 patients who were treated with second line antibiotics, the reasons behind prescribing second line treatment (Figure 3) were renal impairment, urinary pH and sensitivity. These reasons were either separate or were present simultaneously.

DISCUSSION

In this study females presented a higher prevalence of UTIs, however there is a higher proportion of female patients in the hospital. This finding is in agreement with a study carried out by Raz et al. in 2000.⁴ More than one third of UTI patients at RHKG had diabetes mellitus (36.97%, n=61) with 25 were males and 36 females. No association between gender and diabetes was found in this group (p -value=0.083) and there was no association between diabetes and type of UTI (p -value=0.344). In this study more than half (54.5%) of UTI patients at RHKG had a catheter before they contracted UTIs and over two thirds of these, (70.37%) were male patients suffering from prostate problems.

Out of a total of 19 pathogens, *E. coli* was found to be the main aetiological factor for UTIs (46.1%). This was followed by *Enterococcus faecalis* (13.9%), *Proteus mirabilis* (11.5%) and *Pseudomonas aeruginosa* (9.7%). In terms of pathogen types, catheterised patients are more likely to have resistant pathogens when compared to non-catheterised patients (p -value=0.003). Catheterised patients have a higher chance of having two or three types of pathogens in one episode compared to non-catheterised patients (p -value=0.014). This is confirmed by a number of studies including a five year study in a hospital in the United Kingdom where it was reported that polymicrobial presentation in catheterised patients has increased and a change in antimicrobial resistance has been noted.⁵

CONCLUSION

The goal of this study was to assess the percentage of UTI patients who were treated at RHKG and evaluate treatment choices used to manage UTI patients in this hospital. The study provided several important insights into the prevalent pathogens causing UTIs and use of antibacterial agents. The use of nitrofurantoin is adopted as first line management in accordance with UTI hospital guidelines. However, considerations where nitrofurantoin should be avoided may need to be emphasised.

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