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PROFILE OF ANTIBIOTIC USE IN PATIENTS WITH URINARY TRACT INFECTIONS AT ABDOER RAHEM GENERAL HOSPITAL, SITUBONDO

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ABSTRACT

Harmful bacteria multiply, causing urinary tract infections (UTIs). Patients with urinary tract infections often receive antibiotics and supportive care. This study aims to assess the pharmacological treatment of patients with urinary tract infections at RSUD Abdoer Rahem Situbondo. This study used a descriptive design by collecting data retrospectively. This study used a sample of thirty medical records taken using total sampling from May to August 2024. The findings are presented in the form of tables and percentages. The results showed that RSUD Abdoer Rahem Situbondo used urinary tract infection drugs, with 90% of the pharmaceuticals included in the antibiotic class, and cefixime was the most commonly used antibiotic at 27.27%. Ondansetron was the dominant additional treatment, accounting for 21.5% of the total use of additional drugs, followed by ranitidine and lansoprazole at 16.07% and omeprazole and ketorolac at 14.29%.

Key words: Urinary Tract Infection; RSUD Abdoer Rahem

INTRODUCTION

Pathogenic bacteria multiply and cause urinary tract infections (UTIs), a disease that affects approximately 8.3 million people each year. Treatment for bladder infections is tailored to the etiology and severity of the patient's condition. The goal is to eliminate the infection, reduce symptoms, and prevent any negative outcomes. The objective of this study is to determine the antibiotic usage profile among patients with urinary tract infections (UTIs) at Abdoer Rahem Situbondo General Hospital in 2024.

According to Uru et al. (2018), bacteria in the urinary system cause urinary tract infections (UTIs). This disease starts in the urinary tract, then attacks the genitals and possibly the kidneys. The microorganisms responsible for urinary tract infections (UTIs) include Gram-negative bacteria such as Escherichia coli, Proteus mirabilis, Klebsiella pneumoniae, Citrobacter, Enterobacter, and Pseudomonas aeruginosa, as well as Gram-positive bacteria such as Enterococcus faecalis, Staphylococcus saprophyticus, Staphylococcus haemolyticus, and Group B Streptococci.

According to the National Kidney and Urologic Diseases Information

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Clearinghouse (NKUDIC), in 2023, urinary tract infections (UTIs) ranked second among infectious diseases with the highest prevalence after respiratory tract infections, with annual incidence of 8.3 million cases (WHO, 2013). In 2014, the Ministry of Health of the Republic of Indonesia reported that the incidence of urinary tract infections (UTIs) ranged from 90 to 100 cases per 100,000 people per year, equivalent to approximately 180,000 new cases per year (Rowe et al., 2013). Ten percent of women over the age of 65 have been documented to have experienced urinary tract infections in the past 12 years, with an increase of approximately 30% among women over the age of 80 (Dewi., 2021). The Aceh Provincial Health Office reported approximately 1,264 cases of urinary tract infections, with additional cases in Aceh likely going unreported. Hospital X in the city of Aceh documented 313 UTIs in 2021 and 387 cases in 2022.

Factors contributing to urinary tract infections include age, immune system status, catheter insertion technique, catheter care, and duration of catheter placement. Urinary tract infections can affect individuals of all genders and ages. However, among the two alternatives, women are more susceptible to infection than men. The prevalence of bacteriuria in women increases with age and sexual activity. The prevalence of UTIs in women without a partner is lower than in married women. Additionally, many microorganisms, particularly bacteria, but also fungi and viruses, can cause urinary tract infections (UTIs).

The primary treatment for urinary tract infections is the use of antibiotics. Antibiotics are pharmacological agents that inhibit the proliferation or eliminate pathogenic microorganisms (Sunarjati Sudigdoadi, 2012). The administration of antibiotics should depend on the duration of treatment and the associated risk of antibiotic exposure. As a result, antibiotics are classified as complex treatments that require a doctor's prescription and guidelines for administration. Failure to use antibiotics properly can be one of the contributing factors (Mochtar et al., 2015).

There are guidelines from the Indonesian Urological Association (IAUI) for treating urinary tract and male genital infections in 2021. Oral fluoroquinolones and cephalosporins are recommended for a 10–14-day treatment regimen for uncomplicated UTIs. The recommended medications include ciprofloxacin, levofloxacin, trimethoprim-sulfamethoxazole, cefpodoxime, and ceftibuten. Sutarman's 2016 study at Sukoharjo Regional General Hospital reported 100% accuracy in patient indication and identification, 58.73% accuracy in treatment, and 6.35% accuracy in dosage (Nawakasarid et al., 2019).

The appropriate and rational use of antibiotics is essential to prevent antibiotic resistance. Antimicrobial resistance in Indonesia (AMRIN Study) (Antibiotic Resistance in Indonesia: Prevalence and Prevention) revealed that among 2,494 people in Indonesia, 43% of E. coli showed resistance to several classes of drugs. Antibiotics showing resistance include ampicillin (34%), cotrimoxazole (29%), and chloramphenicol (25%). The selection of antibiotics should consider resistance patterns and the patient's history of antibiotic use (Walewangkodkk, 2015).

Research on urinary tract infections is crucial, as this condition ranks second as the most common infectious disease after respiratory tract infections, affecting individuals of all ages and genders. People's habits can influence the risk factors for

urinary tract infections. Furthermore, monitoring antibiotic use is crucial, as prudent use can reduce antibiotic resistance rates, alleviate the disease burden, and improve prognosis. This prompted the authors to investigate the characterization of antibiotic use in patients with urinary tract infections at Situbondo Hospital.

METHODS

This study is an observational study that uses retrospective data collection methods, in which researchers collect data from medical records and conduct their own observations without treating the variables under study.

This study was conducted at Abdoer Rahem Situbondo Regional General Hospital. The data was collected from the medical records of inpatients from May 2024 to August 2024 using the total sampling method. The data collection process began with obtaining ethical clearance from the Health Ethics Committee of Dr. Soebandi University in Jember, as well as permission from Abdoer Rahem Hospital and the Situbondo Health Office. The data collected in the study included name, age, gender, diagnosis, treatment data, and comorbidities experienced by the patients. Treatment data included the name of the medication, type of medication, class of medication, strength of medication, frequency of medication, dosage of medication, and supportive medications.

RESULT AND DISCUSSION

Abdoer Rahem Situbondo Regional General Hospital conducted a study using 30 medical records of patients aged 10 to 90 years who were diagnosed with urinary tract infections (UTIs) by doctors between May and August 2024, categorized by age and gender.

The characteristics of patients based on age at Abdoer Rahem Situbondo Regional General Hospital can be seen in Table 3.1.

Based on Table 3.1, the age group with the highest incidence of ISK therapy is the 41-50 age group, with 8 patients (26%). This is followed by the 51-60 age group with 7 patients (23.3%), the 61-70 age group years old with 4 patients (13.3%), the 10-20 age group with 3 patients (10%), and the 71-80 age group with 3 patients (10%). The aged 31–40 years old (2 patients, 6.6%), the age group of 81 years old and above (6.6%), while the age group of 21–30 years old had 1 patient (3.3%).

Patients undergoing ISK treatment are mostly aged 41–50 years, including 8 (26%). Smeltzer et al. (2018) found that the infection rate increases with age. Urinar tract infections are the most common acute bacterial disease in those over 55 years of age. UTIs increase in people over 50 years of age, peaking in the 50–59 age group, according to Rowe and Juthani (2013) and other studies (Baeti et al., 2021). UTIs increase in people over 50 years of age due to decreased urinary tract function. This study supports Smeltzer et al. (2018). In old age, the urethral sphincter and bladder capacity decline, which can lead to urinary tract infections. Thymus atrophy and reduced activity decrease immunity in those over 50 years of age. Thymus cell involution reduces the number of cells and T cell responses. Apoptosis reduces the growth of cytotoxic T cells (CD8+) and Th1 cells (CD4) despite the proliferation of memory T cells. The immune

system uses cytotoxic T cells (CD8+) to eliminate infected cells based on their antigens. Th1 cells (CD4) assist B cells in producing antibodies. The capacity of the urethral sphincter and bladder decreases in the elderly, which can lead to UTIs (Hariati et al., 2019). This study shows that most urinary tract infections (UTIs) occur in people over the age of 50.

The findings from the study described in Table 3.1 show that female patients received more ISK treatment, with 23 patients (76.6%) compared to 7 male patients (23.3%). Gender affects the prevalence of urinary tract infections, with women at greater risk due to their shorter urethra and physical proximity to the vagina. Plants or bacteria can ascend into the bladder and attach to the urinary tract epithelium. This facilitates their access to the bladder, which is close to the perianal region and vagina (Smeltzer et al., 2018; Sukandar, 2014). These findings align with other studies showing that female UTIs are 56% more likely to develop urinary tract infections (Anita et al., 2016). Hermiyanty's (2016) study revealed that the prevalence of urinary tract infections among female catheter users was significantly higher among those with a history of UTIs, with 32 individuals (69.6%) affected, compared to 14 individuals (37.8%) without such a history. Conversely, male respondents classified as low risk were less likely to experience urinary tract infections (UTIs), with 28 respondents (30.4%) reporting UTIs, compared to 46 respondents (62.2%) who suffered from UTIs. At Imelda Buruh Indonesia General Hospital in Medan, the study showed that women, comprising 26 respondents (66.7%), were the most common victims of urinary tract infections (UTIs), while male respondents, comprising 13 people (33.3%), were in the minority. This disease primarily affects women, with female respondents accounting for 68.47% compared to 31.53% male respondents. This may be due to cultural tendencies to hold urine, which can increase the risk of bacterial proliferation (Hardyati, 2018).

The characteristics of patients based on gender at Abdoer Rahem Situbondo Regional General Hospital can be seen in Table 3.2.

7 male patients (23.3%) and 23 female patients (76.7%). This study shows that those who suffer from ISK are mostly women rather than men.

Overview of ISK Drug Use Based on Type of Therapy

In Table 3.3, the types of ISK drugs used are broken down by type of treatment, such as antibiotic therapy combined with other therapies or other therapies that do not contain antibiotics.

Table 3.3 shows that 21 patients (70%) with urinary tract infections received antibiotic therapy in addition to various forms of supportive therapy, while 9 patients (30%) received only supportive therapy without antibiotics.

Overview of ISK Drug Use Based on Drug Class

The following table shows the distribution of antibiotic use in patients with urinary tract infections (UTIs) based on the class of drugs used. This data includes several types

of antibiotics from various classes, such as Fluoroquinolones, Cephalosporins, and Penicillins. Each class has specific antibiotics administered to patients, and the number of users and their percentages are presented in the table to provide a clearer picture of antibiotic usage patterns in UTI cases.

Based on the table above, it can be seen that the most commonly used antibiotics by patients with UTIs are from the cephalosporin class, with cefixime being the most frequently prescribed drug, accounting for 27.27% of total usage. On the other hand, the fluoroquinolone class is also frequently used, although the percentage varies among different drugs. This indicates a preference for the cephalosporin class in the management of UTIs in this patient population.

The results of the study, as detailed in Table 3.4 on the use of UTIs categorized by drug group, show that 21 patients (70%) used the most common group of antibiotics. The main treatment for urinary tract infections (UTIs) is the use of antibiotics. Antibiotics are the primary class of drugs used to reduce infectious disorders, including Urinary Tract Infections (UTIs). Antibiotics are used to prevent and treat bacterial diseases. Living microorganisms, particularly fungi such as Penicillium sp., produce metabolites that can inhibit or eliminate gram-positive bacteria such as Staphylococcus aureus (Rikomah et al., 2018). The use of antibiotics can accelerate the healing of urinary tract infections compared to administering only symptomatic medications. Antibiotics can inhibit more bacterial infections. The selection of antibiotics for urinary tract infections must be approached with caution to prevent future resistance from pathogens (Rikomah, 2018).

Overview of ISK Drug Use Based on Drug Dosage

The following table shows the use of antibiotics in patients with urinary tract infections (UTIs) based on the dosage of the drug administered. Each type of antibiotic has a variety of dosages prescribed for patients, and this table provides detailed information on the number of users and the percentage of each dosage in the total use of antibiotics for UTIs. This data helps provide an understanding of the pattern of antibiotic dosage administration in UTI patients.

Based on the table above, it can be observed that a 500 mg dose of the antibiotic Cefixime is the most commonly used dose in the treatment of UTIs, accounting for 28.57% of total usage. Additionally, the 625 mg dose of the Amoxicillin+clavulanic acid combination is also frequently used, accounting for 23.81%, while Ceftriaxone accounts for 19.05%. Other antibiotics with doses of 500 mg and 1 g are also used, but at lower percentages. This indicates that the 500 mg dose of Cefixime is the most common dose in UTI therapy.

Overview of ISK Drug Use Based on Route of Administration

The following table illustrates the distribution of antibiotic use in patients with urinary tract infections (UTIs) based on the route of administration. The routes of administration

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consist of oral and injection, where each type of drug has a certain number of users and percentage of total use. This information provides insight into the preferred route of antibiotic administration in UTI cases among the patients analyzed.

Based on the table above, it can be concluded that the oral route is more commonly used in the treatment of UTIs, with Cefixime being the most frequently prescribed drug via this route, accounting for 27.27% of total usage. Meanwhile, the injection route is also quite commonly used, with Amoxicillin+clavulanic acid each accounting for 18.18%, and also . The use of the oral route appears to be more dominant compared to injection, indicating a preference for oral antibiotics in the management of UTIs in this patient population.

Overview of Antibiotic Use in Patients with UTIs Based on Frequency of Administration

The following table shows the frequency of antibiotic use in patients with urinary tract infections (UTIs). The frequency of administration indicates how often each type of antibiotic is given to patients in a day, and this information is useful for understanding the dosage patterns applied. The varying frequency of administration for each antibiotic provides an overview of the treatment needs and intensity in UTI cases.
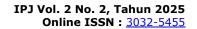
From the table above, it can be seen that antibiotics with a frequency of 2 x 1 (twice a day) administered through Cefixime are the most commonly used frequency, accounting for 27.27% of total usage. Additionally, the 3 x 1 (three times daily) dosage of the Amoxicillin+clavulanic acid combination is also widely used, each accounting for 18.18% of the total. The use of antibiotics with lower dosing frequencies, such as 3 times a day or once a day, is generally less common and distributed across various types of medications. This data indicates that the frequency of antibiotic administration can vary depending on the type of medication and the patient's treatment needs.

The following table shows the use of supportive medications in patients with urinary tract infections (UTIs) based on drug class. These supportive medications include various classes, such as antihypertensives, antiemetics, analgesics, and iron supplements, which are used to address symptoms or other conditions experienced by UTI patients. This information provides insight into the types of supportive medications commonly used to manage additional symptoms in UTI patients.

CONCLUSION

The results of the study indicate that the treatment of urinary tract infections (UTIs) at Abdoer Rahem Situbondo General Hospital from May to August 2024 included antibiotic therapy and supportive care. Seventy percent of medication use was associated with the antibiotic class, with Cefixime being the most commonly used, accounting for 27.27%. Due to its injectable form, Cefixime is the most commonly used antibiotic for

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treating urinary tract infections, particularly in more severe cases. The dominant supportive treatment includes combination drugs used at 70%, namely odancetron at 21.43%, ranitidine and lansoprazole at 16.07%, and omeprazole and ketorolac at 14.29%.

Table 3. 2 shows that the characteristics of ISK patients based on gender are as follows:

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TABLE

Table 3. 1 Percentage of ISK Patients by Age

Age Group	Number	Percentage (%)
10-20 tahun	3	10,00
21-30 tahun	1	3,33
31-40 tahun	2	6,67
41-50 tahun	8	26,67
51-60 tahun	7	23,33
61-70 tahun	4	13,33
71-80 tahun	3	10,00
81-90 tahun	2	6,67
Total	30	100

Table 3. 2 ISPA patients by gender

Gander	Number	Percentage (%)
Male	7	23,33
Female	23	76,66
Total	**30**	**100**

Table 3. 3 Percentage of Use of Various Therapies in Patients with ISK

Macam Terapi	Number	Percentage (%)
Antibiotic therapy + supportive therapy	21	70
supportive therapy	9	30
Total	**30**	**100**

Table 3. 4 Overview of Antibiotic Use in Patients with UTIs Based on Drug Class

Class	Drug Name	Number of Users	Percentage
Floroquinolon	Ciprofloxacin	3	13,64
Floroquinolon	Levofloxacin	1	4,55
Floroquinolon	Ciprofloxacin infus	1	4,55
Sefalosporin	Ceftriaxone	4	18,18

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Sefalosporin	Cefixime	6	27,27
Sefalosporin	Cefuroxim	1	4,55
Penisilin	Amoksisilin+asam klavulanat	5	22,73
Total		21	100,00

Table 3. 5 Overview of Antibiotic Use in Patients with UTIs Based on Drug Dosage

Drug Name	Dosage	Number	Percentage (%)
Ciprofloxacin	500 mg	3	14,29
Levofloxacin	500 mg	1	4,76
Cefixime	500 mg	6	28,57
Ceftriaxone	1 g	4	19,05
Ciprofloxacin infus	1 g	1	4,76
Cefuroxime	1 g	1	4,76
Amoksisilin+asam klavulanat	625 mg	5	23,81
Total		**21**	**100,00**

Table 3. 6 Overview of Antibiotic Use in Patients with UTIs Based on Route of Administration

Route of Administration	Drug Name	Number of Users	Percentage (%)
Oral	Ciprofloxacin	3	13,64
	Levofloxacin	1	4,55
	Cefixime	6	27,27
	Amoksisilin+asam klavulanat	1	4,55
Injeksi	Ciprofloxacin infus	1	4,55
	Ceftriaxone	4	18,18
	Amoksisilin+asam klavulanat	4	18,18
	Cefuroxime	1	4,55
	Total	21	100

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Table 3. 7 Overview of Antibiotic Use in Patients with UTIs Based on Frequency

Frequency	Drug Name	Number of Users	Percentage (%)
3 x 1	Ciprofloxacin	3	13,64
1 x 1	Levofloxacin	1	4,55
1 x 1	Ciprofloxacin infus	1	4,55
	Cefuroxime	1	4,55
	Amoksisilin+asam klavulanat	1	4,55
3 x 1	Ceftriaxone	4	18,18
	Amoksisilin+asam klavulanat	4	18,18
2 x 1	Cefixime	6	27,27
Total		21	100

Table 3. 8 Table of Comorbidities

Comorbidities	Number	Percentage (%)
Hipokalemi	8	26.67%
Bronkitis	4	13.33%
Vertigo	4	13.33%
CKD	4	13.33%
Congestive pulmonum	3	10%
DM	2	6.67%
BPPV	2	6.67%
Dyspepsia	2	6.67%
Akut Ginjal	2	6.67%