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Prevalence and Risk Factors of Urinary Tract Infections in Hospitals in Yogyakarta

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Abstract

Urinary tract infection is an infectious disease that is common in society and brings many disadvantages, including longer treatment and more expensive treatment costs. This study aimed to analyze the prevalence and risk factors for Urinary Tract Infections (UTI) at Hospital, Yogyakarta. The research design is an analytical observational study using a cross-sectional design. The samples in this study were patients diagnosed with Urinary Tract Infection at the hospital. Sample selection method Sampling was carried out by consecutive sampling. Retrieval of data from patient data stored in medical records. Ethics permit from PKU Muhammadiyah Gamping Hospital with number: 053/KEP-PKU/III/2023. The prevalence of UTI during the 2 years of data collection was 65 people, with details of 16 men and 49 women. There is a relationship between length of stay and the incidence of UTI with p = 0.019 and OR = 2.56, there is a relationship between age and UTI with p = 0.001 and OR = 7.113 and there is a relationship between gender and UTI with p = 0.001 and OR = 4,136. The effect of length of treatment, age, and gender on the incidence of UTI was 31.4%. The incidence of UTI was 65 cases. Factors that influence the incidence of UTI are length of stay, age, and gender with a p-value of 31.4%. The study concluded that length of stay, age, and gender significantly influence the incidence of Urinary Tract Infections at Hospital, Yogyakarta, with these factors accounting for 31.4% of the variance in UTI cases.

Keywords: Prevalence; Risk Factors; Urinary Tract Infection; Hospital

Introduction

The urethra, bladder, ureters, and kidneys are all affected by urinary tract infections. UTIs accounted for 10.5 million outpatient visits in the United States in 2007, or 0.9% of all outpatient visits. These trips, which totaled 21.3%, included visits to the hospital's emergency room. One of the most typical initial diagnoses for American women who attend the emergency room is UTI. One of the most typical initial diagnoses for American women who attend the emergency room is UTI. UTI was discovered in 3.7% of patients who had been catheterized for at least 24 hours during their hospital stay (Al-Mijalli, 2022).

One-third of the 1.7 million hospital-acquired illnesses each year are urinary tract infections (UTIs). There is evidence that CAUTI-prone hospitals have higher death rates, longer lengths of stay (LOS), and higher healthcare expenses. The cost of health care is estimated at 290 million dollars per year. Efforts are being made to reduce the duration of catheter insertion to reduce CAUTI. It turns out that some patients are more susceptible to CAUTI due to risk factors, namely women, the elderly, and people with diabetes. Patients undergoing colorectal surgery have a higher CAUTI rate than others (Harris *et al.*, 2017).

Premature birth can make a baby more likely to have a UTI. Premature babies have immature systems that are not fully developed, so they are not able to fight off infections like full-term babies. Uncircumcised boys have slightly more UTIs than circumcised boys (American Academy of Pediatrics), and proper foreskin hygiene can reduce the risk. Poor bathroom hygiene This can be a problem especially for girls, because bacteria will have a shorter distance to travel between the anus and the urinary tract (Konkel & Patham, 2018).

In the current investigation, the determination of the existence of clinical signs or symptoms, such as fever, pyuria, and/or bacteriuria, which may differ from person to person, was mostly dependent on the physician's assessment in the outpatient setting. In fact, because most infections are asymptomatic and the clinical indications are ambiguous and nonspecific, the precise diagnostic criteria for UTI in the elderly and

disabled are yet unknown. Additionally, a significant death rate (22.7%) among our inpatients shows that UTI is a potentially fatal condition. Asymptomatic bacteriuria is prevalent in the elderly, with prevalence rates ranging from 5% to 20% and even higher in long-term care patients, according to several studies. Antibiotic-associated diarrhea and Clostridium difficile infection are a couple of side effects that might result from improper antibiotic prescription (Shih *et al.*, 2019).

Enterococcus, Proteus, Klebsiella, and Pseudomonas aeruginosa are further frequent daughter species. Children are rarely affected by viruses or fungus, which are often limited to the lower urinary tract. The risk of UTI in children is raised by a variety of variables. These include female sex, urolithiasis, neurogenic bladder (NB), bladder and bowel dysfunction (BBD), diabetes mellitus (DM), and immunodeficiency (Daniel *et al.*, 2023).

An infectious disease that frequently affects the community is UTI. Depending on the location of the infection and whether they are straightforward or complicated depending on the underlying condition and anatomical or functional abnormalities of the urinary tract, they are categorized as upper UTI (pyelonephritis) and lower UTI (cystitis, prostatitis). To avoid significant consequences, antibiotic overuse, and the expression of resistant bacteria, it is crucial to have a thorough awareness of these symptoms and to use the right antibiotics(Jabrodini *et al.*, 2018).

The most common type of healthcare-related infection reported to the National Health Safety Network is UTIs. Urinary catheters, which are tubes that are placed into the bladder through the urethra to drain urine, are thought to be the cause of about 75% of UTIs that happen in hospitals. A urinary catheter is given to 15–25% of hospital inpatients over the course of their stay. Long-term urinary catheter use is the main contributor to the development of a catheter-associated UTI (CAUTI). Catheters should therefore only be used when absolutely necessary, and they should be taken out as quickly as possible (Jangtap. S *et al.*, 2022)

With 150 million cases worldwide, urinary tract infections (UTIs) are one of the most prevalent bacterial diseases. There were 10.5 million office visits for UTI symptoms in the United States alone in 2007 (0.9% of all outpatient visits), and 2-3 million visits to emergency rooms. The socioeconomic costs of these infections, including medical expenses and lost productivity, currently total around US$3.5 billion annually in the United States alone. UTIs are a significant contributor to morbidity in women of all ages, newborn men, and elderly men. Only a few of the detrimental outcomes include premature birth, recurrent relapses, pyelonephritis with sepsis, kidney injury in early newborns, high levels of antibiotic resistance, and Clostridium difficile colitis (Kang *et al.*, 2018)

UTIs due to catheter insertion are proven to be common and provide disadvantages in the form of increased UTI incidence, increased length of hospitalization and increased costs of treatment, but research on this problem is still limited. The purpose of this study was to analyze the prevalence and risk factors for urinary tract infection (UTI) in PKU Muhammadiyah Gamping Hospital, Yogyakarta. By knowing the influential factors and the size of the OR, it is hoped that this will further increase motivation to make various efforts to prevent UTI.

Methods

The research design is an analytic observational study using a cross-sectional design. The sample in this study were patients who were diagnosed with UTI at the hospital from January 2019 to December 2022 and met the inclusion and exclusion criteria. The inclusion criteria were inpatients at the hospital from January 2021 to December 31, 2022, and patients diagnosed with sepsis according to hospital protocol. Exclusion criteria were patients diagnosed with bacteremia but incomplete data. Method of sample selection Sampling was conducted by Consecutive sampling. Retrieval of data from patient data stored in medical records. Ethical permit from PKU Muhammadiyah Gamping Hospital with number: 053/KEP-PKU/III/2023.

Results

Table 1. Characteristic of Respondent

Varables	Frequency	Percentage
Length of Treatment		
> 3 days	53	81,5%
<= 3 days	12	18,5%
Age		
> 60 years	49	75,4%
<= 60 years	16	24,6%
Gender		
Female	49	75,4%
Male	16	24,6%

Source: Primary Data, 2023

Table 2. Test results for the Effect of Length of Treatment, Age, and Gender on the incidence of Urinary Tract Infections

	R	B	P	OR	95% CI (B)	EXP
					Lower	Upper
Lack of Treatment	0.321	0,942	0,019	2,565	1,170	5,623

Age	1,962	0,001	7,113	3,408	14,846
Gender	1,420	0,001	4,136	1,939	8,821

Discussion

In this study, the prevalence of UTI during 2 years of data collection was 65, with 16 males and 49 females. There is a correlation between length of stay and the incidence of UTI with p = 0.019 and OR = 2.56, there is a correlation between age and UTI with p = 0.001 and OR = 7.113 and there is a correlation between gender and UTI with p = 0.001 and OR value = 4.136. The effect of length of care, age, and gender on the incidence of UTI was 31.4%. These results need to be compared with other countries.

Depending on the population under consideration and the kind of UTI, behavioral, anatomical, or genetic risk factors for urinary tract infections (UTI) may be present. Pregnancy, for example, can increase the risk of significant infection-related problems or predispose one to a UTI. The evolvable nature of patient requirements and medical interventions means that the risk of UTI changes with time in permanent situations, such as neurogenic bladder dysfunction brought on by spinal cord damage. Better habits (such as better cleanliness or avoiding catheters) can manage modifiable risk factors, however, preventative medication is required in the case of nonmodifiable risk factors (Storme et al., 2019)

The ratio of inpatients to outpatients in this study was 1:2.96. The ratio among affirmative cases is 1:1.401. This suggests that UTIs are more common in the neighborhood. The proportion of male patients to female patients in this study was 1:2.2. The ratio is 1:2.21 in positive circumstances. In both situations, women are taller than men, which creates a prejudice in hiring. The shorter urethra in women compared to men makes them more susceptible to urethral infections, and patient gender is a risk factor for UTI (Syakya *et al.*, 2017)

Additionally connected to behavioral risk factors are UTIs in women. A sedentary lifestyle of more than six hours per day, delayed urination, and poor personal hygiene are associated with an increased risk of recurrent UTI in postmenopausal women. We have investigated assessing additional potential risk factors for UTI in women, such as behavioral and attitudinal traits. We hypothesized that a woman's chance of developing a urinary tract infection (UTI) would be significantly increased if she persistently retained her urine. By employing statistical analysis, we conducted a study to identify the many factors that contribute to urine retention and to test these factors scientifically (Jagtap et al., 2022).

One of the most common diseases acquired in healthcare facilities is an infection of the urinary tract; urethral catheter use is responsible for 70–80% of these infections. Urinary catheters are the most often used device, with 23.6% of patients in 183 US hospitals and 17.5% of patients in 66 European hospitals having one, according to a recent prevalence survey. A 2011 NHSN monitoring survey found that 45-79% of patients in the adult critical care unit, 17% in the medical ward, 23% in the surgical ward, and 9% in the rehabilitation unit all had catheters. In consequence, indwelling urethral catheter use is extremely common in healthcare facilities. Initiatives for minimizing healthcare-associated infections have a priority on avoiding illnesses brought on by these devices (Nicolle, 2014).

UTI is an infection that can be treated in a variety of ways with certain antibiotics. But because of drug resistance, treating UTIs becomes more challenging13. From 1998 to 2011, we discovered a dramatic rise in the incidence of UTI hospitalizations, with cases rising by 76% and incidence rising by 52%. Women experienced the most rise in the number of UTI hospitalizations. Our findings imply that older women (patients older than 70 years) account for the majority of the increase in UTI hospitalizations, even though UTIs are most common in younger women. Men's hospitalizations for urinary tract infections are also rising, especially among older men. Between 2001 and 2011, the typical hospital stay with a primary diagnosis of UTI cost $6424. In 2011, 436,437 patient cases necessitated hospitalization, which resulted in healthcare expenses of $2.8 billion (Shih, e*t al.*, 2019)

The three most prevalent benign disorders in urology are benign prostatic hyperplasia (BPH), urinary tract infections (UTI), and urolithiasis. In contrast to cancer, which shortens life expectancy, this urological benign condition significantly reduces people's quality of life. Around 10.50 million outpatient visits and 2-3 million trips to the emergency room were made for UTIs in the US in 2007, and $3.50 billion was spent on the condition in 2015. According to a comprehensive review and meta-analysis of 31 research, the prevalence of lifetime BPH is 26.20%. The prevalence of urolithiasis varies by area; in Australia in 2000, it was 7.0%; in Spain in 2007, it was 5.06%; in the United States it was 8.80%; and in China it was 6.50%. The prevalence of urolithiasis varies by area; in Australia in 2000, it was 7.0%; in Spain in 2007, it was 5.06%; in the United States it was 8.80%; and in China it was 6.50%. Over the past 50 years, urolithiasis has had a significant impact on society; in 2014, it was predicted to cost $5.30 billion annually. Aging populations, socioeconomic advancements, and improvements in illness prevention and control have all contributed to changes in the disease spectrum during the past few decades. However, thorough and recent

epidemiological data on UTI, urolithiasis, and BPH are still lacking (Zhu et al., 2021).

UTIs can result in more serious infections like sepsis and are among the third most frequent bacterial infections among older patients that require hospitalization for infection-related reasons. According to a 2016 study from the Centers for Disease Control and Prevention's Emerging Infections Program, 42% of sepsis cases originated in the community, and 25% of individuals hospitalized with sepsis also experienced UTI. 61.8% of patients between 2012 and 2014 had sepsis that was acquired in the community (Osakwe et al., 2019).

Catheter-related urinary tract infections are a common nosocomial illness. The Centers for Medicare and Medicaid Services began imposing financial penalties on hospitals in 2015 for CAUTI rates that were higher than anticipated. Although it is not a clinical diagnosis, the monitoring definition for CAUTI may refer to asymptomatic bacteriuria (Davies *el al.,* 2018)

A typical infectious disease in society is urinary tract infection (UTI). Depending on the location of the infection and whether they are straightforward or complicated depending on the underlying condition and anatomical or functional abnormalities of the urinary tract, they are categorized as upper UTI (pyelonephritis) and lower UTI (cystitis, prostatitis). Clinical signs and symptoms of UTI range from asymptomatic bacteriuria to septic shock. To avoid significant problems and antibiotic abuse as well as to stop the development of resistant bacteria, it is crucial to have a thorough understanding of these symptoms and to use the proper antibiotics (Kang *et al.,* 2018)

Guidelines for treating lower urinary tract infections are straightforward in light of rising antibiotic resistance because, as of 2010, nitrofurantoin and fosfomycin were suggested as first-line treatments. Since then, its use has multiplied dramatically. Nitrofurantoin is less effective than newer medications like fluoroquinolones in a meta-analysis of randomized clinical studies, while this has not been seen for fosfomycin. Fosfomycin had a 70% efficacy rate in clinical trials conducted in the 1990s compared to 96% and 94% for ciprofloxacin and trimethoprim/sulfamethoxazole, respectively (Datta et al., 2018).

Disadvantages of UTIs Urinary tract infections (UTIs) are often considered hospital-acquired infections (HAIs), with a 36% incidence of catheter-associated urinary tract infections (CAUTIs). It is the largest cause of UTIs, accounting for 67% and 97% in the ICU, respectively. The incidence of CAUTI increases rapidly with prolonged catheterization. In addition, CAUTI also results in a very large burden of care, increased hospitalization costs, patient pressure, discomfort, pain, and activity restrictions. One study in Australia showed that 1.7% of patients who were hospitalized for more than 48 hours with a UTI infection would increase the number of days of stay by an average of 4 days (Parker et al., 2017).

Conclusion

The incidence of UTI is 65 cases. Factors that influence the incidence of UTI are length of stay, age, and gender with a p-value of 31.4%. The OR was 2.565 for length of stay, 7.113 for age, and 4.136 for sex. Knowing the influential factors and the size of the OR, it is hoped that this will further increase motivation to make various efforts to prevent UTI

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Author Contribution and Competing Interest

The author's contribution to this study was to collect data through the analysis of inpatient medical record files, conduct in-depth observations and interviews, analyze the results, and compile manuscripts.

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