

The Influence Of Urine Sample Type (Morning Urine And 12-Hour Urine) On Nitrates, Leukocytes, And Ph In The Carik Celup Method In Urine Of Patients With Urinary Tract Infection

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ABSTRACT

Urinalisa is a diagnostic test used to monitor kidney and urinary tract conditions. In the dipstick method, the most important parameters for urinalisa testing are bacteria, white blood cells, red blood cells, nitrite, and protein. Morning urine and urine collected 12 hours later can affect the testing results for nitrite, white blood cells, and pH in patients with urinary tract infections (UTIs). To determine the effect of urine sample type on the results of nitrite, white blood cells, and pH in patients with urinary tract infections (UTIs) using the dipstick method. This study employed an observational analytical design with a purposive sampling method, selecting patients with UTIs who visited RSUD Kab. Dompu in 2024 based on inclusion and exclusion criteria, resulting in a total sample size of 24. The results of the examination were mostly positive for nitrites and leukocytes, while the pH tended to be normal with morning urine samples. However, the majority were positive for nitrites and leukocytes, while the pH tended to be normal with 12-hour urine samples in UTI sufferers at District Hospital Dompu. There is an influence on examining the types of morning urine samples and 12 hour urine samples on the results of nitrite and leukocytes in UTI sufferers at District Hospital Dompu.

INTRODUCTION

Urinary tract infection (UTI) is one of the most common diseases in women, and not only adults but also adolescents. UTI is the most common type of infection in outpatients, with a lifetime incidence of 50-60% in adult women. UTI is a disease that can cause gonorrhea, herpes, mycoplasma, cancer of the urinary tract. UTIs that are left untreated or unsolved will cause complications that endanger the body, with death as the most feared danger. According to WHO (World Health Organization), urinary tract infections cause 8.3 million cases each year, ranking second most common infection after respiratory tract infections. A survey in Hospitals in the United States showed that more than 13,000 people died from UTI, which is 2.3 percent of total deaths. UTI cases are 3.2% in people under 40 years of age, and 20% in people over 65 years of age. According to the American Urological Association (AUA, 2016), there are 150 million people worldwide who suffer from UTI each year (Mokos., 2023).

Urinary tract infections (UTIs) are the most common infections that occur in the community and even in hospitals. UTI cases are highest in children, especially in women because of the short urinary tract or urethra and closer to the anus, only 8% of sufferers

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show symptoms of urinary tract infections. Usually in the urine of patients with urinary tract infections, erythrocytes will be found in low to high amounts depending on how large the wound is causing the infection in the urinary tract (Robinson, 2014).

One of the urinalysis examinations is the dipped shredding method. According to (Noveling, 2020), the dipping tear examination is in the form of a piece of rigid plastic that is partially attached to one to ten suction papers each containing specific reagents against one of the substances that may be in the urine. The presence and abundance of substances is characterized by a certain color change in the part that contains the specific reagent in the dip shredding (D. A. N. M., 2023). In the dip method, the parameters examined include nitrites, leukocytes and pH which are one of the examinations to diagnose urinary tract infection abnormalities and so on.

There are several types of urine samples that can be taken, including morning urine, and 12-hour urine tamping. The dip tear test, which is a cheaper and faster test that shows results, can be used as an alternative to screening for UTIs in pregnancy (Ocviyanti & Fernando, 2012).

Diagnosis of urinary tract infection can be confirmed by laboratory examination, one of which is urinalysis. Urinalysis is one of the examinations that functions to monitor the condition of the kidneys and urinary tract. In the dipstick test method, the most important parameters for urinalysis examination are bacteria, leukocytes, erythrocytes, nitrite, and protein. These parameters are considered to indicate the condition of the kidneys and urinary tract (Sarihati., 2019).

MATERIALS/METHOD

The design used in this study is analytical observational, namely research that is directed at explaining a thing or situation.

RESULTS AND DISCUSSION

The results of morning urine and 12-hour urine collection using the dipstick method in patients with urinary tract infections (UTIs) with a sample size of 24 at the Dompu District Hospital in 2024 can be seen in table 1.

Table 1 Results of morning urine and 12-hour urine collection using the dipstick method in patients with urinary tract infections (UTIs) at the Dompu District Hospital in 2024.

NO	Kode Sampel	Jenis Urine	Hasil Pemeriksaan Urine		
			Nitrit	Leukosit	Ph
1	S1	Urine pagi	Positif 1	Positif 1	6.5
		Urine tampung 12 jam	Positif 1	Positif 2	6.0
2	S2	Urine pagi	Positif 1	Positif 2	6.0
		Urine tampung 12 jam	Positif 1	Positif 1	6.0
3	S3	Urine pagi	Positif 1	Positif 1	7.0
		Urine tampung 12 jam	Positif 1	Positif 1	6.5
4	S4	Urine pagi	Positif 1	Positif 2	7.0
		Urine tampung 12 jam	Positif 1	Positif 2	6.5

NO	Kode Sampel	Jenis Urine	Hasil Pemeriksaan Urine		
			Nitrit	Leukosit	Ph
5	S5	Urine pagi	Positif 1	Positif 2	6.5
		Urine tampung 12 jam	Positif 1	Positif 2	6.5
6	S6	Urine pagi	Positif 1	Positif 2	6.5
		Urine tampung 12 jam	Positif 1	Negatif	6.0
7	S7	Urine pagi	Positif 1	Positif 2	6.0
		Urine tampung 12 jam	Positif 1	Positif 2	6.0
8	S8	Urine pagi	Positif 1	Positif 3	6.0
		Urine tampung 12 jam	Positif 1	Positif 2	6.0
9	S9	Urine pagi	Positif 1	Positif 2	7.0
		Urine tampung 12 jam	Positif 1	Positif 1	6.0
10	S10	Urine Pagi	Positif 1	Positif 1	6.5
		Urine tampung 12 jam	Positif 1	Positif 3	7.0
11	S11	Urine Pagi	Positif 1	Positif 1	6.5
		Urine tampung 12 jam	Positif 1	Positif 2	7.0
12	S12	Urine Pagi	Positif 1	Positif 2	6.5
		Urine tampung 12 jam	Positif 1	Positif 3	7.0
13	S13	Urine Pagi	Positif 1	Positif 1	6.5
		Urine tampung 12 jam	Positif 1	Positif 2	6.5
14	S14	Urine Pagi	Negatif	Negatif	6.0
		Urine tampung 12 jam	Negatif	Positif 1	6.0
15	S15	Urine Pagi	Positif 1	Positif 1	6.5
		Urine tampung 12 jam	Positif 1	Positif 2	6.5
16	S16	Urine Pagi	Positif 1	Positif 2	6.5
		Urine tampung 12 jam	Positif 1	Positif 2	6.5
17	S17	Urine Pagi	Positif 1	Positif 2	7.0
		Urine tampung 12 jam	Positif 1	Positif 1	6.5
18	S18	Urine Pagi	Positif 1	Positif 1	6.0
		Urine tampung 12 jam	Positif 1	Positif 1	6.0

NO	Kode Sampel	Jenis Urine	Hasil Pemeriksaan Urine		
			Nitrit	Leukosit	Ph
19	S19	Urine Pagi	Negatif	Positif 1	6.5
		Urine tampung 12 jam	Negatif	Positif 1	6.0
20	S20	Urine Pagi	Positif 1	Positif 2	7.0
		Urine tampung 12 jam	Positif 1	Positif 1	7.0
21	S21	Urine Pagi	Negatif	Negatif	6.5
		Urine tampung 12 jam	Negatif	Negatif	6.5
22	S22	Urine Pagi	Positif 1	Positif 1	6.0
		Urine tampung 12 jam	Positif 1	Positif 1	6.0
23	S23	Urine Pagi	Positif 1	Positif 2	6.0
		Urine tampung 12 jam	Positif 1	Positif 2	6.0
24	S24	Urine Pagi	Positif 1	Positif 1	6.0
		Urine tampung 12 jam	Positif 1	Positif 1	6.0

The examination was conducted with 24 samples based on the type of urine, both morning urine and 12-hour urine collection, on the amount of nitrite in UTI patients can be seen in table 2.

Table 2. Cross Tabulation of Urine Types against Nitrite Examination Results in Urinary Tract Infection (UTI) Patients at the Dompu District Hospital in 2024.

Nitrit		Jenis Urine		Total
		Pagi	Tampung 12 Jam	
Negatif	Jumlah sampel	3	3	6
	% Jenis Urine	12.5%	12.5%	12.5%
Positif	Jumlah sampel	21	21	42
	% Jenis Urine	87.5%	87.5%	87.5%
Total	Jumlah sampel	24	24	48
	% Jenis Urine	100.0%	100.0%	100.0%

Based on table 4.2 above, between the types of urine and the nitrite results, the majority of samples had positive nitrite values, namely 21 (87.5%) UTI patients, and a small proportion had negative nitrite values, namely 3 (12.5%) UTI patients.

Table 3. Cross Tabulation of Urine Types against Leukocyte Examination Results in Urinary Tract Infection (UTI) Patients at Dompu District Hospital in 2024.

Leukosit	Jenis Urine	Total
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		Pagi	Tampung 12 Jam	
Negatif	Jumlah sampel	2	2	4
	% Jenis Urine	8.3%	8.3%	8.3%
Positif 1	Jumlah sampel	10	10	20
	% Jenis Urine	41.7%	41.7%	41.7%
Positif 2	Jumlah sampel	11	10	21
	% Jenis Urine	45.8%	41.7%	43.8%
Positif 3	Jumlah sampel	1	2	3
	% Jenis Urine	4.2%	8.3%	6.3%
Total	Jumlah sampel	24	24	48
	% Jenis Urine	100.0%	100.0%	100.0%

Based on table 4.3 above, between the types of urine and the leukocyte results, the samples obtained in morning urine with a positive value of 2 leukocytes were 11 (45.8%), positive 1 leukocyte was 10 (41.7%), positive 3 was 1 (4.2%) and negative 2 (8.3%) and in 12-hour urine with a positive value of 2 leukocytes was 10 (41.7%), positive 1 was 10 (41.7%), positive 2 was 2 (8.3%) and negative 2 (8.3%).

Table 4. Cross Tabulation of Urine Types against the Results of pH Value Examination in Urinary Tract Infection (UTI) Patients at Dompu District Hospital in 2024.

Nilai pH		Jenis Urine		Total
		Pagi	Tampung 12 Jam	
6.00	Jumlah	8	12	20
	% Jenis Urine	33.3%	50.0%	41.7%
6.50	Jumlah	11	8	19
	% Jenis Urine	45.8%	33.3%	39.6%
7.00	Jumlah	5	4	9
	% Jenis Urine	20.8%	16.7%	18.8%
Total	Jumlah	24	24	48
	% Jenis Urine	100.0%	100.0%	100.0%

Based on table 4.4 above, between the types of urine and the pH value, the majority were found to have a pH of 6.0, as many as 12 (50.0%) in 12-hour urine and a small portion with a pH of 7.0, as many as 4 (16.7%) in 12-hour urine and the majority with a pH of 6.5, as many as 11 (22.9%) in morning urine and a small portion with a pH of 7.0 (20.8%) in morning urine.

To determine the relationship between the influence of urine sample types on UTI examination results at Dompu District Hospital in 2024 because the data scale is ordinal, a test was carried out using a non-parametric test so that a normality test was not carried out on the sample, the statistical test used was the Chi Square test which can be seen in table 5.

Table 5. Results of Chi Square statistical test on the results of examination of samples of urinary tract infection (UTI) patients at the Dompu District Hospital 2024

	Nitrit	Leukosit	Nilai pH
Chi-Square	27.000 ^a	24.167 ^b	4.625 ^c
df	1	1	1
Asymp. Sig.	.000	.000	.099

Based on the type of urine with a urine pH value in UTI patients, results were obtained in morning urine samples as many as 11 (45.8%) UTI patients with a urine pH of 6.50, 8 (33.3%) UTI patients with a urine pH of 6.00 and 5 (20.8%) UTI patients with a urine pH of 7.00. In the 12-hour urine sample, as many as 8 (33.3%) UTI patients with a urine pH of 6.50, 12 (50%) patients with I SK with a urine pH of 6.00 and 4 (16.7%) UTI patients with a urine pH of 7.00 (table 4.4). In this study, the pH in the urine of UTI patients was still in the normal category (6.0-7.0). The pH test on morning urine can provide more accurate information than on a 12-hour urine test, because the morning urine test is more representative of the normal condition of the kidneys that are not affected by other fluid intake. Research (Yusrina et al., 2023) gave the same result that the pH of morning urine was lower than the pH of 12-hour urine which showed that morning urine was more concentrated and concentrated.

Based on the results of the statistical test above, the results of the sig. pH value ($P > 0.05$) were obtained, meaning that the pH value has no relationship between the influence of the type of urine sample on the results of the UTI examination and the results of the sig. nitrite and leukocytes ($P < 0.05$) were obtained, meaning that there is a positive influence between nitrite and leukocytes with the influence of the type of sample on the results of the UTI examination at the Dompu District Hospital in 2024.

One of the tests to detect urinary tract infections (UTIs) can be done using a dipstick test which is a rapid test to determine the results of the examination. Morning urine is the first urine excreted in the morning after waking up, morning urine is more concentrated than afternoon urine so it is good for examining sediment, specific gravity, etc. While 12-hour urine collection is urine excreted at a specifically determined time which is used for routine examinations. In urine dipsticks, the things observed are leukocytes, nitrite, and pH. Nitrite examination can help in determining the diagnosis of UTI and predicting the presence of bacteria in urine so it is very important in monitoring infections. The presence of leukocytes in urine indicates a bacterial infection (Parwati & Cahyani, 2023). pH examination in UTI patients has an important role in the diagnosis and monitoring of infections. Urine pH that tends to be abnormal can indicate a bacterial infection associated with UTI.

CONCLUSIONS

Based on the research that has been carried out, it was concluded that in the urine examination both using morning urine samples and 12-hour urine tamping, most of the results were obtained with positive nitrites and leukocytes while the pH tended to be normal. In addition, there was also an influence on the examination of the type of morning urine sample and 12-hour urine on nitrite and leukocyte results in UTI patients.

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