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Original Article

Risk Factors of Urinary Tract Infection through Demographic and Laboratory Markers among Benign Prostate Hyperplasia Patients: a Single-Center Study

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Abstract

Introduction: Prostate enlargement known as benign prostatic hyperplasia (BPH) increases the risk of infection in the urinary tract by obstructing or blocking the prostatic portion of the urethra. This disease becomes more common as people age.

Aim: To determine differences in the risk of urinary tract infection based on demographics and laboratory markers in patients with benign prostate hyperplasia.

Materials and methods: The present study is quantitative analytical observational research. Patients from Vita Insani Hospital's Urology Polyclinic in Pematangsiantar during 2021–2023 made up the study's population. In sampling, we used the purposive sampling technique.

Results: Medical records were used to gather data, which were then subjected to univariate and bivariate analyses using SPSS. The present study found that there were statistically significant differences between the neutrophil lymphocyte and the platelet-lymphocyte ratios in the incidence of urinary tract infections among BPH populations ($p<0.05$), while other studies documented that risk factors such as monocyte-to-lymphocyte ratio, catheter use, comorbidity status, and renal functions (urea, creatinine, and GFR levels) did not show significant differences ($p>0.05$).

Conclusion: It is expected that health workers, especially nurses in hospitals can provide information, always monitor signs of infection and apply aseptic procedures in performing catheter insertion actions to BPH patients to avoid urinary tract infections.

Keywords

benign prostate hyperplasia, urinary tract infection, urethral blockage

INTRODUCTION

Benign prostatic hyperplasia (BPH) is the most common benign tumor in men, and its incidence is age-related. The prevalence of histologic BPH in autopsy studies rises from approximately 20% in men aged 41–50 years, to 50% in men aged 51–60 years, and up to 90% in men older than 80 years. Although clinical evidence of the disease is available less commonly, symptoms of prostatic obstruction are also age-related.[1] Additional investigations have demonstrated a positive correlation between free testosterone and estrogen levels to the volume of BPH. The latter may suggest that the association between aging and BPH might result from the increased estrogen levels of aging causing induction of the androgen receptor, which thereby sensitizes the prostate to free testosterone.[2-4]

The epidemiology of BPH in Indonesia is less well documented. Approximately 50% of Indonesian men over 50 have BPH, according to a study, and up to 20% of men with lower urinary tract symptoms (LUTS) have a BPH diagnosis.[5,6] The prevalence of urinary tract infection (UTI) BPH and prostate cancer patients were 35.9% and 34.6%, respectively. *Escherichia coli* was the most commonly isolated microbiological agent, and nitrofurantoin, with a high sensitivity against the organisms, should be considered in the empirical treatment of the infection. The presence of an indwelling urethral catheter was the only independent predictor of this infection. Thus, preventive measures should be instituted to prevent catheter-associated infections in these patients.[7] A UTI, which may mimic the irritative symptoms of BPH, can be readily identified by urinalysis and culture; however, UTI can also be resulted as a complication of BPH; hence identifying the risk factors among those populations is unquestionably important. Although irritative voiding complaints are also associated with carcinoma of the bladder, especially carcinoma in situ, the urinalysis usually shows evidence of hematuria. Inability to empty the bladder completely may raise the risk of UTI, hence surgical removal of the prostate might be indicated if a patient presented with persistent UTIs.[8]

AIM

We aimed to conduct a study to evaluate the differences in the UTI risk based on demographics, blood infection markers, and renal function in patients with BPH at Vita Insani Hospital, Pematang Siantar, Indonesia.

MATERIALS AND METHODS

Protocol registration

This protocol received a certificate of ethical eligibility from the Prima Indonesia University Health Research Ethics Commission and a research permit from Vita Insani Hospital, Pematangsiantar, Indonesia under the issued official letter ID of 020/SPH/F1.1.E/UNPRI/II/2024.

Study design

This type of research is analytical observational on differences in the risk of urinary tract infections based on demographics, laboratory markers in BPH patients (data collected from medical records of Vita Insani Hospital Pematangsiantar) in 2021-2023, considering our investigation focused on the relationship between the dependent variable and the other variables. We utilized retrospective approach by collecting secondary data in the form of patient medical records from 2021-2023 at Vita Insani Hospital Pematangsiantar. The samples taken from this study were patients at our center who met the inclusion criteria: patients with a diagnosis of BPH, complete medical record data, patients with blood infection marker examination results, and patients with kidney function test results. The exclusion criteria were patients with a multipartner sexual history, patients with a history of HIV/AIDS (history of sexual activity or needles sharing activity), patients with a history of hematuria due to cancer and trauma, patients with chronic kidney disease, and patients with incomplete medical records.

Statistical analysis

This study used SPSS for the following statistical data analysis and hypothesis testing. Univariate analysis was conducted to describe the differences between each independent variable and the dependent variable. This analysis uses the mean, median, standard deviation and maximum and minimum values for numerical data. Categorical data (frequency and percentage) are then presented in tabular form. Bivariate analysis was performed with Epi Info to analyze the risk (odd ratio, OR) and risk difference (RD) of each independent variable, namely demographics, blood infection markers, frequency of catheterization, length of catheterization use, comorbidities, and renal function on urinary tract infection among BPH patients. Data were tested for normality for numerical data using Kolmogorov-Smirnov test if the data was >50, if the data was <50, then the Shapiro-Wilk normality test was be used. Statistical analysis used an independent T-test to determine differences in risk factors if the data was known to be normally distributed. In addition, categorical data analysis was also used using chi-square if eligible, if the expected count was <5 then the Fisher Exact test or Fisher Freeman Halton Exact test was used.

RESULTS

In this study, data were collected from 750 patients from the Urology Clinic of Vita Insani Hospital Pematangsiantar in 2021-2023, but only 381 BPH patients who met the inclusion and exclusion criteria were included in the final analysis.

Based on **Table 1**, there is a statistically significant difference in NLR (p=0.015) between non-UTI group 2.95 (0.01-45.5) and the UTI group 3.77 (1.2-23.25), PLR (p=0.003) between non-UTI group 13,055.56 (3,396.23-177,500), and the UTI group 17,133.13 (4,729.73-116,750). But there was no statistically significant difference in MLR (p=0.312) between non-HIU group 0.26 (0.05-3), and the UTI group 68 0.28 (0.03-1.75). Data analysis of frequency and length of catheter use found that there was no statistically significant difference in the frequency of catheter use (p=0.381) between non-UTI group 1 (0-2) times and the UTI group 1 (0-2) times. It is also known that there is no statistically significant difference in the length of catheter use (p=0.889) between groups with the distribution of the length of catheter use in the non-UTI group 7 (0-19) days and the UTI group 7 (0-19) days. Comorbidity data analysis found that there was no statistically significant relationship between DM and the incidence of UTI in patients with benign prostate hyperplasia at Vita Insani Hospital Pematangsiantar (p=0.087, p>0.05). Then it is known that there is no statistically significant relationship between HT and the incidence of UTI in benign prostate hyperplasia patients at Vita Insani Hospital Pematangsiantar (p=0.000; p>0.05) between HT and the incidence of UTI. Renal function data analysis found there was no statistically significant difference in the urea levels (p=0.074) between the non-UTI group which had a median of 30 (10-225) and the UTI group whose median was 33.5 (15-228). There was no statistically significant difference in creatinine (p=0.484) between the non-UTI group, whose median was 9 (0.7-64), and the UTI group, whose median was 8 (0.7-28). It was found that there was no statistically significant difference in GFR (p<0.001) between the non-UTI group, which had a median of 70 (8-114), and the UTI group, whose median was 67 (6-108).

According to the demographic data analysis, there was no significant difference (p=0.116) in the incidence of UTI among BPH patients between districts. Siantar Martoba had the highest number of UTI patients (6 patients, 37.5%), while Siantar Sitalasari district had the highest number of patients without UTI (38, 31%) **(Table 2)**.

Table 2. Demographic data of the population based on the districts

District	Not UTI	UTI	*P*-value
	n (%)	n (%)	
West Siantar	13 (10.9 %)	2 (12.5 %)	
Siantar Marihat	1 (0.8 %)	1 (6.25 %)	
Siantar Marimbun	10 (8.4 %)	0 (0.0)	
Siantar Martoba	17 (14.2 %)	6 (37.5 %)	
South Siantar	9 (7.5 %)	1 (6.25 %)	0.116[a]
Siantar Sitalasari	38 (31 %)	2 (12.5 %)	
East Siantar	18 (15 %)	2 (12.5 %)	
North Siantar	13 (10.9 %)	2 (12.5 %)	
Total	119 (100.0%)	16 (100.0%)	

[a] chi-square test

DISCUSSION

BPH is a histologic diagnosis that refers to the proliferation of smooth muscle and epithelial cells within the prostatic transition zone. The prevalence and the severity of LUTS in the aging male can be progressive and is an important diagnosis in the healthcare of patients and the welfare of society.[9] This study was conducted on benign prostate hy-

Table 1. Differences in the risk factors among UTI vs. non-UTI populations

Variables		Median [Min-Max]		*P*-value
		Not UTI	UTI	
Infection markers	NLR	2.95 (0.01–45.5)	3.77 (1.2–23.3)	0.015[b]
	PLR	13.055.56 (3.396.2–177.5)	17.133.13 (4.729.73–116.8)	0.003[b]
	MLR	0.26 (0.05–3)	0.28 (0.03–1.8)	0.312[b]
Catheters use	Frequency	1 (0–2)	1 (0–2)	0.381[b]
	Duration (days)	7 (0–19)	7 (0–19)	0.889[b]
Comorbidity data analysis	DM (–)	305 (80.1)	60 (15.7)	0.087[c]
	DM (+)	16 (4.2)	0 (0)	
	HT (–)	306 (80.3)	57 (15)	1.000[c]
	HT (+)	15 (3.9)	3 (0.8)	
Renal function	Urea (mg/dl)	30 (10-225)	33.5 (15–228)	0.074[b]
	Creatinine (mg/dl)	9 (0.7–64)	8 (0.7–28)	0.484[b]
	GFR	70 (8-114)	67 (6–108)	0.176[b]

NLR: neutrophil lymphocyte ratio; PLR: platelet-lymphocyte ratio; MLR: monocyte-to-lymphocyte ratio; DM: diabetes mellitus; HT: hypertension; GFR: glomerular filtration rate; [a] chi-square test; [b] Mann-Whitney test; [c] Fisher exact test;

perplasia patients in 2021-2023 at the Urology clinic of Vita Insani Pematangsiantar Hospital who met the inclusion and exclusion criteria aimed at determining differences in the risk of urinary tract infections based on demographics, blood infection markers, and renal function in BPH patients.

Based on the results of the study, it can be stated that there is no statistically significant difference between age and the incidence of UTI in BPH patients at Vina Insani Hospital in Pematangsiantar with a value of p=0.102 (p>0.05) with a median age of 66 years for patients without UTI and patients with UTI with a median age of 67.5 years. The results of this study are supported by Tuntun and Aminah's research that there is no relationship between age and the incidence of UTI.[10]

There is no relationship between age with the incidence of UTI in this study can be caused by the age of BPH patients who experience UTI or not UTI aged 65 years and over. This can be seen from the results of a survey conducted at a geriatric hospital showing that the average age of UTI patients is above 65 years of age.[11,12] Herlina and Yanah's research found that as many as 66.7% of UTI patients were elderly, while Tusino and Widyaningsih found that the incidence of UTI was more often experienced by children in the age range of 5-12 years.[13,14]

According to Basuki, urinary tract infections can affect patients of all ages, from newborns to the elderly.[13] However, the incidence of bacteriuria will increase with aging and incapacity due to the degeneration process in old age which results in decreased capacity and increased bladder contractions resulting in increased urgency and frequency.[15]

The results of this study showed that there were statistically significant differences in NLR and PLR with the incidence of UTI in BPH patients at Vina Insani Hospital Pematangsiantar with a p value of <0.05. NLR examination has been widely used as a prognostic factor in various conditions, including UTI. High levels of NLR are associated with longer duration of hospitalization, oxygen requirements, and delayed elimination of the virus from the body. This marker is widely used because it has been shown to have the best specificity and sensitivity compared to other leukocyte markers and is more affordable than other tests such as D-dimer, IL-6 and C-reactive protein (CRP).[16-18]

Another test is the PLR test. Although considered less effective than NLR, PLR has been shown to be better than general leukocyte examination. High PLR levels have been associated with greater disease severity.[18] From the results of this study, NLR and PLR were able to identify the incidence of UTI in BPH patients. This examination can also be used as a biomarker for patients with coronary heart disease. The NLR and PLR ratios were significantly higher in stable ischemic heart patients than in unstable patients.[19]

Monocyte lymphocyte ratio (MLR) along with NLR and PLR are used as biomarkers of inflammation in various medical conditions. This study found that there was no statistically significant difference in MLR with the incidence of UTI in BPH patients at Vina Insani Hospital Pematangsiantar in this study with p>0.05. This can be caused by the absence of an assessment of the MLR value limit for UTI cases. Reinforced by Fauzia et al. that MLR can support the diagnosis of a disease, but it still needs to be done, especially the assessment of the limit value of MLR. NLR, PLR, and MLR are three hematology parameters that are cheap and easy to find. The results can be automatically output from the hematology analyzer [20].

Catheter insertion is one of the medical solutions to remove urine from the bladder due to the patient's inability to pass it spontaneously.[21] The results of this study obtained that there was no statistically significant difference in the frequency of catheter use with the incidence of UTI in BPH patients at Vina Insani Hospital Pematangsiantar with a p>0.05 value. Nababan showed different results from this study that the frequency of catheter use was significantly associated with the incidence of UTI.[22]

There is no statistically significant difference in the frequency of catheter use with the incidence of UTI in this study that could be due to the nurses who inserted the catheter and worked according to the SOP. According to Selano et al., if catheter care is not carried out properly and correctly, there is a risk of UTI.[23] Prophylactic strategies can be targeted for UTI prevention including limiting the use of urinary catheters. If catheterization is necessary, proper aseptic practices for catheter insertion and maintenance, as well as closed catheter collection systems are essential to prevent UTI.[24]

It is also known that there is no statistically significant difference in the duration of catheter use with the incidence of UTI in BPH patients at Vina Insani Hospital Pematangsiantar with a p>0.05 value. This result is different from the research of Ana et al. that the length of catheter insertion is significantly related to the incidence of UTI in patients in the internal medicine room of the Tk II Dr. Soepraoen Hospital. Prolonged catheterization may result in a higher incidence of UTI. Bacteriuria may appear after the second day of urinary catheter insertion and the risk of developing bacteriuria increases with the duration of catheterization.[25]

The results of this study have shown that there is no statistically significant relationship between diabetes mellitus and the incidence of UTI in BPH patients at Vita Insani Hospital Pematangsiantar with p>0.05. The results of this study are in line with the research of Kocur et al. that diabetes mellitus is not significantly associated with the incidence of UTI. Tuntun and Aminah's research also supports that there is no relationship between diabetes mellitus and UTI.[23]

Diabetes mellitus can increase the risk of infectious diseases, and most often predisposes to UTIs, especially in immunocompromised individuals. This condition increases the risk of acute pyelonephritis, asymptomatic bacteriuria, and complications of urinary tract infections.[25,26] There are no differences between the incidence of UTI and diabetes in this study; this could be because patients with a history of DM who have benign prostate hyperplasia have strong immune systems and did not get UTIs.

The results of this study suggest that there is no statistically significant difference in hypertension with the incidence of UTI in BPH patients at Vita Insani Hospital Pematangsiantar with $p>0.05$. The results of this study differ from the research of Adha et al. which showed that a history of hypertension is associated with the incidence of UTI.[27] Patients with a history of hypertension had a 0.352 chance of first UTI and recurrent UTI.[21] The absence of differences between hypertension and the incidence of UTI in this study is likely because most BPH patients at Vita Insani Hospital don't have a history of hypertension, so other factors besides hypertension are more potential risk factors for the occurrence of UTI.

This study found that urea levels, creatinine, and glomerular filtration rate (GFR) were not statistically significantly different from the incidence of UTI in BPH patients at Vita Insani Hospital Pematangsiantar with $p>0.05$. UTI can be the beginning of kidney failure. Uncontrolled UTIs can cause inflammation of the bladder and spread to the kidneys so that damage to the kidneys occurs.[28] A decrease in the GFR ratio in BPH patients indicates that there have been complications from UTI due to chronic kidney disorders.[29] The absence of differences in GFR in this study may be due to the GFR ratio between BPH patients with UTI and non-UTI showing numbers that are not much different or there is no significant decrease in the GFR ratio.

CONCLUSION

We observed NLR and PLR as a potential marker to predict UTI in BPH patients according to our investigation on the Pematangsiantar-based populations. Subsequently, other observed factors e.g., MLR, catheter use, comorbidity status, and renal function were not statistically different among UTI vs. non-UTI populations. It should be acknowledged that the major limitations of our study are small population numbers per region and restricted-to-unavailable access to region-specific risk factors identification, considering several subdistricts in Pematangsiantar possessed relatively higher UTI in BPH rate.

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Conflict of Interest

None declared.

REFERENCES

1. McAninch JW, Lue TF, editors. Smith & Tanagho's General Urology. 19th ed. New York: McGraw-Hill Education; 2020.
2. Patel ND, Parsons JK. Epidemiology and etiology of benign prostatic hyperplasia and bladder outlet obstruction. Indian J Urol 2014; 30(2):170–6.
3. Lu SH, Chen CS. Natural history and epidemiology of benign prostatic hyperplasia. Formosan J Surg 2014; 47(6):207–10.
4. Lim KB. Epidemiology of clinical benign prostatic hyperplasia. Asian J Urology 2017; 4(3):148–51.
5. Sampekalo G, Monoarfa RA, Salem B. [Incidence of lower urinary tract symptoms caused by benign prostatic hyperplasia in Prof. Dr. Dr. R. D. Kandou Hospital in Manado in the period 2009-2013]. e-CliniC 2015 3(1):568–72. [Indonesian] doi: 10.35790/ecl.3.1.2015.7609
6. Dasar RK. [Health research and development agency]. 2019 [Indonesian]
7. Tolani MA, Suleiman A, Awaisu M, et al. Acute urinary tract infection in patients with underlying benign prostatic hyperplasia and prostate cancer. Pan Afr Med J 2020; 36(169):1–9.
8. Wingate JT, Partin AW, Green KL. Benign prostatic hyperplasia. In: Partin AW, Kavoussi LR, Peters CA, Dmochowski RR, editors. Campbell Walsh Wein Handbook of Urology - E-Book. Elsevier Health Sciences; 2022.
9. Sandhu JS, Bixler BR, Dahm P, et al. Management of lower urinary tract symptoms attributed to benign prostatic hyperplasia (BPH): AUA guideline amendment 2023. J Urol 2024; 211(1):11–9.
10. Tuntun M, Aminah S. Correlation between urine dipstick results (leukocyte esterase, nitrite and glucosuria) with the incidence of UTI in employees. J Health 2021; 12(3):465–71.
11. Nazik S, Hakkoymaz H. The assessment of etiology and risk factors of urinary tract infections in geriatric patients admitted to emergency department. J Surg Med 2022; 6(5):547–51.
12. Kocur SB, Noppenberg M, Sowińska I, et al. Selected risk factors for urinary tract infections. Nursing Problems/Problemy Pielęgniarstwa 2023; 31(3):128–32.
13. Herlina S, Mehita AK. [Factors influencing the occurrence of urinary tract infections in adult patients at the Bekasi City Regional Hospital]. Widya Gantari Indonesian Nursing Journal 2015; 2(2):100–15 [Indonesian].
14. Tusino A, Widyaningsih N. [Characteristics of urinary tract infection in children ages 0-12 years in X hospital Kebumen Central of Java. Biomedika 2017;9(2):39–46.
15. Reginawatia S, Fauziah W M. Risk Factor Analysis for Urinary Tract Infection in Outpatients at A Hospital in Subang, Indonesia. Indones Nurs J. 1(1):33–7 [Indonesian].
16. Bzeizi K, Abdulla M, Mohammed N, et al. Effect of COVID-19 on liver abnormalities: a systematic review and meta-analysis. Sci Rep 2021; 11(1):10599.
17. Du M, Yang S, Liu M, et al. COVID-19 and liver dysfunction: Epidemiology, association and potential mechanisms. Clin Res Hepatol Gastroenterol 2022; 46(2):101793.
18. Rotty LW, Andrea D, Fujiyanto F, et al. [Relationship between neutrophil lymphocyte ratio, platelet lymphocyte ratio, and ferritin with remdesivir treatment in Covid-19 patients with increased transaminase]. e-CliniC 2023; 11(3):322–9 [Indonesian]. doi: https://doi.org/10.35790/ecl.v11i3.46845
19. Joshi A, Bhambhani A, Barure R, et al. Neutrophil-lymphocyte ra-

tio and platelet-lymphocyte ratio as markers of stable ischemic heart disease in diabetic patients: An observational study. Medicine 2023; 102(5):e32735.
20. Purnamasari P, Rachmawati B. [Differences in neutrophyl lymphocyte ratio, platelet lymphocyte ratio and monocyte lymphocyte ratio in type 2 diabetes mellitus patients with and without cardiovascular complications]. Medica Hospitalia: Journal of Clinical Medicine. 2018; 5(1):31-5 [Indonesian].
21. Ana KD, Riwayati NY, Jayanti SF. [The relationship between the length of catheter insertion and the incidence of urinary tract infections in patients in the internal medicine room of Tk II Dr. Soepraoen Hospital Malang]. Care 2020; 8(2):138-45 [Indonesian].
22. Nababan T. [Catheter insertion with the incidence of urinary tract infection in patients in the hospitalization room]. Prior Nurs J 2020; 3(2):23–30.
23. Selano MK, Panjaitan RN, Raharjo SB. [The relationship between nurses' compliance in implementing standard operating procedures for fixed catheter care and the incidence of urinary tract infection]. Smart Nursing Journal 2019; 6(1):1-7 [Indonesian].
24. Chenoweth CE. Urinary Tract Infections. Infect Dis Clin North Am 2016
25. Akash MSH, Rehman K, Fiayaz F, et al. Diabetes-associated infections: development of antimicrobial resistance and possible treatment strategies. Arch Microbiolol 2020; 202:953–65.
26. Kamei J, Yamamoto S. Complicated urinary tract infections with diabetes mellitus. J Infect Chemother 2021; 27:1131–6.
27. Adha MIZ, Hanriko RA. Relationship between age and hypertension with the incidence of BPH in the surgical ward of Dr. H. Abdul Moeloek hospital in 2017. JIMKI 2020; 8(1):32–7.
28. Baroleh JM, Ratag TB, Langgi FL. [Factors associated with chronic kidney disease in patients at the outpatient installation of Pancaran Kasih General Hospital Manado]. Public Health 2019; 8(7):8 [Indonesian].
29. Wang Q, Zhang B, Li B, et al. Correlation between benign prostatic hyperplasia/lower urinary tract symptoms and renal function in elderly men aged 80 years and older. Clin Interv Aging 2023; 18:61–9.

Факторы риска инфекции мочевыводящих путей по демографическим и лабораторным маркерам среди пациентов с доброкачественной гиперплазией предстательной железы: одноцентровое исследование

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Резюме

Введение: Увеличение простаты, известное как доброкачественная гиперплазия предстательной железы (ДГПЖ), увеличивает риск инфекции мочевыводящих путей, закупоривая или блокируя простатический отдел уретры. Это заболевание становится более распространённым с возрастом.

Цель: Определить различия в риске инфекции мочевыводящих путей на основе демографических данных и лабораторных маркеров у пациентов с доброкачественной гиперплазией предстательной железы.

Материалы и методы: Настоящее исследование представляет собой количественное аналитическое наблюдательное исследование. Пациенты из урологической клиники больницы Vita Insani в Пематангсиантаре в 2021–2023 годах составили популяцию исследования. При отборе проб мы использовали метод целенаправленной выборки.

Результаты: Для сбора данных использовались медицинские записи, которые затем подвергались однофакторному и двуфакторному анализу с использованием SPSS. Настоящее исследование показало, что существуют статистически значимые различия между соотношением нейтрофильных лимфоцитов и тромбоцитов к лимфоцитам в частоте инфекций мочевыводящих путей среди популяций ДГПЖ ($p < 0.05$), в то время как другие исследования документально подтвердили, что такие факторы риска, как соотношение моноцитов к лимфоцитам, использование катетера, статус сопутствующих заболеваний и функции почек (уровни мочевины, креатинина и GFR), не показали значимых различий ($p > 0.05$).

Заключение: Ожидается, что работники здравоохранения, особенно медсёстры в больницах, смогут предоставлять информацию, всегда отслеживать признаки инфекции и применять асептические процедуры при выполнении действий по вставке катетера пациентам с ДГПЖ, чтобы избежать инфекций мочевыводящих путей.

Ключевые слова

доброкачественная гиперплазия предстательной железы, инфекция *мочевыводящих путей*, *закупорка уретры*