

Uji Diagnostik Pewarnaan Gram dan Urin Dipstik Dibandingkan dengan Pemeriksaan *Gold Standard* Kultur pada ISK Nonkomplikata

Andrian Novatmiko¹, Desvita Sari², Endang Sri Lestari¹, Purnomo Hadi^{1,2}, V. Rizke Ciptaningtyas¹

¹ Program Studi Mikrobiologi Klinik, Universitas Diponegoro Semarang

² Departemen Mikrobiologi Klinik, RSUP Dr. Kariadi, Semarang

Abstrak

Latar Belakang. ISK nonkomplikata merupakan jenis ISK yang paling sering terjadi di masyarakat sehingga membutuhkan intervensi medis yang tepat dan evaluasi berkelanjutan. Kultur urin merupakan baku emas tetapi memiliki kelemahan yaitu memerlukan waktu yang relatif lama. Pewarnaan Gram dan urin dipstik merupakan metode cepat untuk membantu menegaskan diagnosis ISK.

Tujuan. Menganalisis sensitivitas, spesifisitas, *positive predictive value* (PPV), *negative predictive value* (NPV), dan akurasi pewarnaan Gram dan urin dipstik untuk diagnosis ISK nonkomplikata.

Metode. Penelitian ini merupakan penelitian observasional analitik dengan pendekatan uji diagnostik. Penelitian dilaksanakan di Puskesmas Poncol dan Puskesmas Pandanaran, Semarang. Penelitian melibatkan 83 sampel dengan usia ≥ 18 tahun yang didiagnosis dokter dengan ISK nonkomplikata. Waktu pengambilan dimulai bulan April 2024 sampai dengan terpenuhinya jumlah sampel yang dibutuhkan. Pengambilan sampel urin dengan metode *clean catch midstream urine*.

Hasil. Sebanyak 83 sampel diuji, terdapat 23 di antaranya menunjukkan hasil positif pada pemeriksaan kultur urin. Hasil uji diagnosis menunjukkan pemeriksaan nitrit memiliki nilai sensitivitas 43,5%, spesifisitas 93,3%, PPV 71,4%, NPV 81,2% dan akurasi 79,5%. Pada pemeriksaan leukosit esterase menunjukkan nilai sensitivitas 78,3%, spesifisitas 73,3%, PPV 52,9%, NPV 89,7% dan akurasi 74,7%. Hasil pemeriksaan kombinasi nitrit dan leukosit esterase menunjukkan sensitivitas 86,9%, sedangkan nilai spesifisitas, PPV, NPV dan akurasi secara berturut-turut yaitu 71%, 54,1%, 93% dan 75,9%. Pada pewarnaan Gram menunjukkan nilai sensitivitas 95,6%, spesifisitas 71,7%, PPV 56,4%, NPV 97,7% dan akurasi 78,3%.

Kesimpulan. Pewarnaan Gram memiliki sensitivitas yang lebih baik dari pada urin dipstik sehingga pewarnaan Gram dapat menjadi pilihan utama untuk membantu menegaskan diagnosis ISK nonkomplikata.

Kata kunci: infeksi saluran kemih nonkomplikata, pewarnaan Gram, urin dipstik

Diagnostic Evaluation of Gram Staining and Urine Dipstik Compared with the Gold Standard Culture in Uncomplicated Urinary Tract Infections

Andrian Novatmiko¹, Desvita Sari², Endang Sri Lestari¹, Purnomo Hadi^{1,2}, V. Rizke Ciptaningtyas¹

¹Department of Clinical Microbiology, Diponegoro University, Semarang

²Department of Clinical Microbiology, RSUP Dr. Kariadi, Semarang

Abstract

Background. Uncomplicated urinary tract infections (UTIs) represent the most frequently encountered type of UTI in the community, thereby necessitating appropriate medical intervention and continuous clinical evaluation. Although urine culture remains the gold standard, it has notable limitations, particularly its relatively long processing time. Gram staining and urine dipstik testing serve as rapid diagnostic tools that can aid in the identification of UTIs.

Objective. To analyze the sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and accuracy of Gram staining and urine dipstik tests for the diagnosis of uncomplicated UTI.

Methods. This study was an analytical observational study using a diagnostic test approach. The research was conducted at Poncol and Pandanaran Primary Health Centers in Semarang. A total of 83 urine samples were collected from patients aged ≥ 18 years who were clinically diagnosed with uncomplicated UTI by physicians. Sample collection was performed using the clean-catch midstream urine method, starting from April 2024 until the required sample size was achieved.

Results. A total of 83 samples analyzed, 23 tested positive for urine culture and sensitivity. Diagnostic test results showed that nitrite levels had a sensitivity of 43.5%, a specificity of 93.3%, PPV of 71.4%, a NPV of 81.2%, and an accuracy of 79.5%. Leukocyte esterase levels showed a sensitivity of 78.3%, a specificity of 73.3%, a PPV of 52.9%, a NPV of 89.7%, and an accuracy of 74.7%. The combined analysis of nitrites and leukocyte esterase showed a sensitivity of 86.9%, while the specificity, PPV, NPV, and accuracy were 71%, 54.1%, 93%, and 75.9%, respectively. The Gram staining showed a sensitivity value of 95.6%, a specificity of 71.7%, a PPV of 56.4%, a NPV of 97.7% and an accuracy of 78.3%.

Conclusion. Gram staining has better sensitivity than urine dipstik, making it a preferred choice for confirming the diagnosis of uncomplicated UTI.

Keywords: uncomplicated urinary tract infection, Gram staining, urine dipstik.