

INTISARI

Latar Belakang: Infeksi saluran Kemih (ISK) merupakan salah satu jenis infeksi yang paling sering dijumpai. Prevalensinya terus mengalami peningkatan secara global. Bakteri menjadi patogen penyebab tersering pada ISK. Pemeriksaan kultur urin sebagai baku emas penegakan diagnosis ISK masih menghadapi tantangan terutama karena lamanya waktu dan tingginya biaya pemeriksaan. Hasil negatif kultur urin yang didapat dari pasien dengan dugaan ISK juga cukup tinggi. Pemeriksaan yang praktis dan cepat seperti pada fitur *flagging* UTI urinalisis metode *flow cytometry* dapat membantu penapisan ISK yang penting dalam penentuan pemberian antibiotik empiris dan mengurangi kultur urin yang tidak diperlukan.

Tujuan: Menilai validitas diagnostik *flagging* UTI urinalisis metode *flow cytometry* untuk penapisan ISK.

Metode: Penelitian ini menggunakan desain uji diagnostik dengan pendekatan potong lintang. Subjek penelitian adalah pasien dewasa suspek ISK yang memenuhi kriteria inklusi dan eksklusi serta mengirimkan sampel urin untuk pemeriksaan kultur urin ke Laboratorium RSUP Dr. Sardjito. Validitas diagnostik *flagging* UTI urinalisis metode *flow cytometry* dibandingkan dengan kultur urin sebagai baku emas dilakukan dengan analisis tabel 2x2

Hasil: Sebanyak 186 subjek suspek ISK yang memenuhi kriteria terlibat dalam penelitian ini. Median usia 56 tahun, dengan proporsi jenis kelamin perempuan (55,4%) lebih banyak dibandingkan laki-laki (44,6%). Terdapat 65 subjek (34,9%) positif ISK berdasarkan *cuf off* angka kuman urin $\geq 10^5$ CFU/mL pada pemeriksaan kultur urin. Analisis validitas *flagging* UTI urinalisis metode *flow cytometry* dengan *cuf off* jumlah leukosit $>87/uL$ dan bakteri $>582/uL$ menunjukkan tingkat sensitivitas 81,54%, spesifisitas 79,34%, $LR+$ 3,95, $LR-$ 0,23, PPV 67,95%, NPV 88,89% dan akurasi 80,11%.

Simpulan: Validitas diagnostik *flagging* UTI urinalisis metode *flow cytometry* dengan *cuf off* jumlah leukosit $>87/uL$ dan bakteri $>582/uL$ memiliki akurasi sebesar 80,11% dengan sensitivitas sebesar 81,54% Hasil ini menunjukkan kemampuan yang cukup baik untuk penapisan ISK.

Kata kunci: Infeksi Saluran Kemih, Kultur Urin, *Flow cytometry*, Sensitivitas

ABSTRACT

Background: Urinary tract infection (UTI) is among the most frequently seen infections, and its prevalence is rising worldwide. Bacteria are the most common pathogens responsible for UTIs. Urine culture, which is the gold standard for diagnosing UTIs, still faces challenges, particularly due to the prolonged processing time and significant expense. A considerable proportion of negative urine culture results is also observed among patients suspected of having a UTI. Practical and rapid examinations, such as UTI flagging features in flow cytometry urinalysis, can aid in UTI screening, which is crucial for determining empirical antibiotic therapy and reducing unnecessary urine cultures.

Objective: Determine the diagnostic validity of flagging UTI urinalysis through flow cytometry method for UTI screening.

Method: This study is diagnostic test featuring a cross-sectional analysis. The participants in the study are adult individuals clinically suspected of having a UTI who submitted urine sample for urinalysis and urine culture tests to the laboratory of Dr. Sardjito General Hospital, meeting the inclusion and exclusion criteria. The diagnostic performance of UTI flagging feature through flow cytometry urinalysis is compared to urine culture method through the 2x2 table analysis.

Result: Total of 186 subjects with clinical symptoms of UTI who met the criteria were enrolled in this study. The median age was 56 years, with a higher proportion of female participants (55.4%) compared to males (44.6%). Among them, 65 subjects (34.9%) were confirmed to have UTI based on a urine culture bacterial count cutoff $\geq 10^5$ CFU/mL. Validity of UTI flagging method via flow cytometry urinalysis, with cut-off values of leucocyte count $>87/\mu\text{L}$ and bacteria $>582/\mu\text{L}$, demonstrated sensitivity 81.54%, specificity 79.34%, positive likelihood ratio (LR+) 3.95, negative likelihood ratio (LR-) 0.23, positive predictive value (PPV) 67.95%, negative predictive value (NPV) 88.89%, and an overall accuracy 80.11%.

Conclusion: The validity of UTI flagging in flow cytometry urinalysis method, using cut-off values of leucocyte count $>87/\mu\text{L}$ and bacteria $>582/\mu\text{L}$, demonstrated an accuracy 80,11% and sensitivity of 81.54%, reflecting good capability of this method for UTI screening.

Keywords: Urinary tract infection, Urine culture, Flow cytometry, Sensitivity