SKOR INDIKATOR KLINIS DAN URINALISIS SEBAGAI PREDIKTOR INFEKSI SALURAN KEMIH PADA ANAK

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INTISARI

Latar belakang: Infeksi saluran kemih (ISK) merupakan bakteriuria dan piuria signifikan yang disertai dengan gejala klinis. Prevalensi anak ISK dengan kultur positif sebesar 21,4%. Tidak semua rumah sakit di Indonesia memiliki pemeriksaan kultur urin. Hingga saat ini belum didapatkan studi yang meneliti skor indikator klinis dan urinalisis pada anak ISK dengan kultur urin positif.

Tujuan: Mengetahui model skor indikator klinis dan urinalisis yang dapat memprediksi ISK pada anak.

Metode: Dilakukan studi kasus kontrol dengan sampel anak ISK 0-18 tahun rawat inap/jalan di Instalasi Kesehatan Anak RSUP Dr. Sardjito Yogyakarta periode Januari 2020-Desember 2021 yang memenuhi kriteria inklusi dan ekslusi. Sampel diambil secara *consecutive sampling.* Hubungan antar variabel dinyatakan dengan *odds ratio* (OR) dan interval kepercayaan 95% dengan tingkat kemaknaan statistik p<0,05. Pembuatan skor menggunakan koefisien regresi variabel bermakna pada analisis multivariat, dilanjutkan dengan perhitungan kualitas model skor dengan kurva ROC, probabilitas masing-masing skor dan *cut-off* skor. Setelah mendapat model skor, dilanjutkan dengan penyederhanaan model skor untuk aplikasi klinis.

Hasil: Prevalensi ISK anak dengan kultur urin positif sebesar 54,7%. Kelompok kasus terdiri dari 235 anak ISK dengan kultur urin positif dan kelompok kontrol terdiri dari 218 anak ISK dengan kultur urin negatif. Perbandingan perempuan dan laki-laki adalah 1,2:1 dengan usia anak ISK terbanyak 1-24 bulan dan>84 bulan. Bakteri penyebab utama ISK adalah *Escherichia coli* sebesar 31,1%. Analisis bivariat, multivariat dan skor menunjukan ISK kompleks (p=0,004; AOR 3,78; IK95% 1,521-9,404; skor 1), imunokompromais (p=0,018; AOR 2,41; IK95% 1,164-4,973; skor 1), demam ≥38^0C (p<0,001; AOR 4,61; IK95% 2,075-10,221; skor 2), muntah (p<0,016; AOR 2,65; IK95% 1,195-5,876; skor 1), gejala ISK spesifik usia (p<0,001; AOR 10,76; IK95% 5,033-22,991; skor 3), kateter urin (p=0,019; AOR 2,64; IK95% 1,173-5,928; skor 1), nitrit (p<0,001; AOR 14,57; IK95% 5,862-36,190; skor 2), leukosit esterase ≥+2 (p<0,001; AOR 9,88; IK95% 4,721-20,686; skor 3) dan bakteriuria ≥470/µL (p=0,001; AOR 3,72; IK95% 1,766-7,824; skor 1) merupakan prediktor anak ISK dengan hasil kultur urin positif.

Kesimpulan: Skor indikator klinis dan urinalisis yang terdiri dari ISK kompleks, imunokompromais, demam ≥38^{0}C, muntah, gejala ISK spesifik usia, katerisasi urin, nitrit, leukosit esterase ≥+2 dan bakteriuria ≥ 470/µL dengan batas skor ≥7 dapat memprediksi anak ISK dengan sensitivitas 90,6%, spesifitas 89,4% dan AUC 96% dengan nilai *p* <0,001. Sedangkan untuk model skor sederhana yang terdiri dari demam ≥38^{0}C, gejala ISK spesifik usia, nitrit dan leukosit esterase ≥+2 dengan batas skor ≥4 dapat memprediksi anak ISK dengan sensitivitas 93,2%, spesifitas 81,2% dan AUC 94,5% dengan nilai *p* <0,001.

Kata kunci: Infeksi saluran kemih, kultur urin positif, anak, indikator klinis dan urinalisis, prediktor, sistem skor.

SCORING OF URINALYSIS AND CLINICAL INDICATOR AS PREDICTOR IN CHILDREN WITH URINARY TRACT INFECTION

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ABSTRACT

Background: Urinary tract infection (UTI) is a combination of bacteriuria and pyuria with clinical manifestation and often occurs in children. The prevalence of culture-positive UTI in children varies from 21,4 to 35,5%. Not all hospitals in Indonesia have urine culture examinations. To date, there was no study examining clinical dan urinalysis indicators as predictors of culture-positive UTI.

Objective: To determine clinical and urinalysis score model that can predict culture-positive UTI in children.

Methods: A case-control study was performed. Samples were UTI children aged 0 to 18 years old who came to Pediatric Department of Dr. Sardjito Hospital from January 2020 to December 2021 and met the inclusion criteria. Samples were taken with consecutive sampling method. The relationship between variables were presented as odds ratio (OR), confidence intervals 95%, score each variable and statistical significance levels p<0,05. The score was made using the regression coefficient of the significant variable in the multivariate analysis followed by the calculation of the ROC curve to determine the quality of score model and the probability of each score. After getting the score model, it was continued with the simplification of the score model for clinical application.

Results: The prevalence of positive urine culture UTI in children was 54,7%. The case group consists of 235 culture-positive UTI children and the control group consists of 218 culture-negative UTI children. The ratio of females and males was 1,2 to 1, with the most UTI children aged 1-24 months and >84 months. The most common bacteria in UTI was *Escherichia coli.* Bivariate and multivariate analysis showed complicated UTI (p=0,004; AOR 3,78; CI95% 1,521-9,404; 1 point), immunodeficiency (p=0,018; AOR 2,41; CI95% 1,164-4,973; 1 point), fever ≥38^{0}C (p<0,001; AOR 4,61; CI95% 2,075-10,221; 2 point), vomiting (p<0,016; AOR 2,65; CI95% 1,195-5,876; 1point), age specified UTI symptoms (p<0,001; AOR 10,76; CI95% 5,033-22,991; 3 point), urine catheter (p=0,019; AOR 2,64; IK95% 1,173-5,928; 1 point), nitrite (p<0,001; AOR 14,57; CI95% 5,862-36,190; 2 point), leukocyte esterase ≥+2 (p<0,001; AOR 9,88; CI95% 4,721-20,686; 3 point) dan bacteriuria ≥470/µL (p=0,001; AOR 3,72; CI95% 1,766-7,824; 1 point) were predictive factors of culture-positive UTI in children.

Conclusion: Clinical and urinalysis indicator scores consist of complicated UTI, immunocompromised, fever ≥38^0C, vomiting, age specified UTI symptoms, nitrite, leukocyte esterase ≥+2, bacteriuria ≥470/µL with a cut-off score ≥7 can predict children with UTI with sensitivity of 90,6%, specificity of 89,4% and AUC 96% with *p* value <0,001. Meanwhile, the simple score model consist of fever ≥38^0C, age specified UTI symptoms, nitrite, leukocyte esterase ≥+2 with a cut-off score ≥4 can predict children with UTI with sensitivity of 93,2%, specificity of 81,2% and AUC 94,5% with *p* value <0,001.

Keywords: Urinary tract infection, culture-positive, child, urinalysis and clinical indicator, predictors, scoring.