Nilai Diagnostik Neutrophil Gelatinase-Associated Lipocalin (NGAL) Urin, Kelainan Urinalisis, dan Kombinasi Keduanya pada Infeksi Saluran Kemih Anak Usia 2–5 Tahun = Diagnostic Value of Urinary Neutrophil Gelatinase-Associated Lipocalin, Urinalysis Abnormalities and Their Combinations in Urinary Tract Infection in Children Aged 2–5 Years Old

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Abstrak

Infeksi saluran kemih (ISK) pada anak memiliki manifestasi klinis yang tidak khas dan bervariasi sehingga sulit terdiagnosis secara dini. Biakan urin memerlukan waktu hingga lima hari sehingga dapat menyebabkan keterlambatan terapi serta tingginya komplikasi ISK pada anak. Kelainan urinalisis yang saat ini digunakan masih memiliki spesifisitas yang rendah. Penelitian ini merupakan studi diagnostik NGAL urin, kelainan urinalisis, dan kombinasi keduanya, khususnya pada anak usia 2–5 tahun. Penelitian dilakukan menggunakan desain potong lintang pada anak dengan tersangka ISK, yaitu anak dengan salah satu gejala ISK (demam lebih dari 380C, muntah, diare, sakit pinggang, atau gejala lokal saluran kemih) disertai kelainan urinalisis (leukosituria, dan/atau nitrit positif dan/atau leukosit esterase positif) yang berusia 2–5 tahun dan dirawat di Rumah Sakit Dr. Cipto Mangunkusumo. Uji diagnostik pemeriksaan NGAL urin, kelainan urinalisis, dan kombinasi keduanya dibandingkan dengan biakan urin sebagai baku emas. Kombinasi ketiga kelainan urinalisis berupa leukosituria, nitrit dan leukosit esterase positif memiliki sensitivitas 38,1% dan spesifisitas 94,9%. NGAL urin diketahui memiliki sensitivitas 85,7% (IK95%: 63,6–96,9%), spesifisitas 74,3% (IK 95%: 57,8–86,9%), positive predictive value 64,3% (IK95%: 50,6–75,9%), dan negative predictive value 90,6% (IK95%: 76,9–96,5%) pada anak dengan minimal satu kelainan urinalisis. Pemeriksaan NGAL urin hanya meningkatkan spesifisitas kelainan urinalisis berupa leukosituria saja dan tidak meningkatkan spesifisitas pada yang telah memiliki tiga kelainan urinalisis. NGAL urin tidak dianjurkan untuk meningkatkan spesifisitas urinalisis dalam diagnosis ISK pada anak usia 2–5 tahun. Gabungan tiga kelainan urinalisis tanpa NGAL urin sudah memiliki spesifisitas yang baik. Perlu dilakukan penelitian biomarker lain yang dapat mendiagnosis dini ISK dengan lebih baik.
.....Urinary tract infection (UTI) in children has unspecific clinical manifestations leading to difficulties in its early diagnosis. Using urine culture as the gold standard for diagnosing urinary tract infection may need five days to know and may lead to delayed treatment and high complication rates. Urinalysis abnormalities are used to diagnose UTI early but still have low specificity. This study evaluated the diagnostic value of using urinary NGAL, urinary abnormalities, and their combinations, especially in children aged 2–5 years old. This cross-sectional diagnostic study was conducted in children aged 2–5 years old who were suspected to have UTI (fever more than 380C, vomit, diarrhea, abdominal pain, flank pain, or local UTI symptoms with abnormalities in urinalysis including leukocyturia and/or positive nitrite and/or positive leukocyte esterase) who were hospitalized at Dr. Cipto Mangunkusumo Hospital. The diagnostic test was performed to urinary NGAL, urinary abnormalities, and their combination compared with urine culture as the gold standard for UTI diagnosis. Combination of urinary abnormalities (leukocyturia, positive nitrite, and positive leukocyte esterase) can have sensitivity 38.1% and specificity 94.9%. Urinary NGAL has sensitivity

85.7% (IK 95%: 63.6–96.9%), specificity 74.3% (IK 95%: 57.8–86.9%), positive predictive value 64.3% (IK 95%: 50.6–75.9%), and negative predictive value 90.6% (IK 95%: 76.9–96.5%). Combination of urinary NGAL and urinary abnormality can only increase specificity urinalysis which only shows leukocyturia from 74.3% to 97.4% but not increase specificity of three urinary abnormalities. Urinary NGAL is not recommended to increase urinalysis specificity to make early diagnosis of UTI in children aged 2–5 years old. The three combination of urinalysis abnormalities without urinary NGAL have had a good specificity. Further research about other biomarkers to make early diagnosis of UTI in children is needed.