

# Penentuan Cut-off Rasio Protein/Kreatinin Urin Sewaktu untuk Evaluasi Proteinuria pada Pasien Sindrom Nefrotik = Determination of The Cut-off of The Urinary Protein/Creatinine Ratio to Evaluate Proteinuria in Nephrotic Syndrome Patient

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## Abstrak

Latar belakang: Pengukuran proteinuria kuantitatif sewaktu (rasio protein/kreatinin urin sewaktu) merupakan metode terbaik untuk evaluasi proteinuria sebagai penanda remisi komplit dan nephrotic-range proteinuria pada pasien anak sindrom nefrotik (SN), karena dianggap lebih praktis dibandingkan baku emas (protein urin tampung 24 jam).

Tujuan: Mencari cut-off optimal rasio protein/kreatinin urin sewaktu untuk evaluasi nephrotic-range proteinuria dan remisi komplit dalam penelitian kami serta membandingkan sensitivitas, spesifisitas, nilai duga positif, dan nilai duga negatif antara cut-off yang ditemukan dalam penelitian versus KDIGO (Kidney Disease: Improving Global Outcomes) untuk evaluasi nephrotic-range proteinuria dan remisi komplit.

Metode: Penelitian ini merupakan studi potong lintang dengan uji diagnostik yang melibatkan 96 sampel urin 24 jam dan urin sewaktu yang diambil dari anak dengan sindrom nefrotik berusia 3-18 tahun. Subjek penelitian selain diambil sampel urin untuk pemeriksaan protein urin tampung 24 jam dan rasio protein/kreatinin urin sewaktu, juga dilakukan pemeriksaan antropometri untuk menentukan status nutrisi. Analisis menggunakan kurva ROC untuk menentukan cut-off optimal rasio protein/kreatinin urin sewaktu untuk evaluasi nephrotic-range proteinuria dan remisi komplit dalam penelitian kami, kemudian dihitung nilai sensitivitas, spesifisitas, nilai duga positif, dan nilai duga negatif serta dibandingkan nilainya dengan cut-off yang telah ditetapkan oleh KDIGO.

Hasil: Cut-off optimal rasio protein/kreatinin urin sewaktu dalam penelitian kami untuk evaluasi proteinuria yang menandai remisi komplit adalah  $<0,4$  g/g dan yang menandai nephrotic-range proteinuria (tidak remisi/relaps) adalah  $>1,5$  g/g. Perbandingan nilai sensitivitas, spesifisitas, PPV, dan NPV antara cut-off rasio protein/kreatinin urin sewaktu  $<0,4$  g/g (temuan penelitian) berturut-turut 80,1%, 82,3%, 89,1%, dan 68,3% versus cut-off rasio protein/kreatinin urin sewaktu  $<0,2$  g/g (KDIGO) berturut-turut 95,2%, 44,1%, 75,6%, dan 83,3%. Perbandingan nilai sensitivitas, spesifisitas, PPV, dan NPV antara cut-off rasio protein/kreatinin urin sewaktu  $>1,5$  g/g (temuan penelitian) untuk evaluasi nephrotic-range proteinuria berturut-turut 88,5%, 84,3%, 67,7%, dan 95,2% versus cut-off rasio protein/kreatinin urin sewaktu  $>2$  g/g (KDIGO) berturut-turut 84,6%, 91,4%, 78,6%, dan 94,1%.

Kesimpulan: Cut-off rasio protein/kreatinin urin sewaktu untuk evaluasi proteinuria nephrotic-range proteinuria (tidak remisi/relaps) pada penelitian kami memperkuat cut-off yang telah dikeluarkan oleh KDIGO sebesar  $>2$  g/g, sementara cut-off untuk evaluasi remisi komplit lebih tinggi nilainya dibandingkan KDIGO sebesar  $<0,4$  g/g.

.....Background: Quantitative measurement of proteinuria while (urinary protein/creatinine ratio) is the best method for evaluating proteinuria as a marker of complete remission and nephrotic-range proteinuria in nephrotic syndrome (NS) pediatric patients, because it is considered more practical than the gold standard (24 hours urine protein collection). Objective: Finding the optimal cut-off of urinary protein/creatinine ratio

while evaluating nephrotic-range proteinuria and complete remission in our study and comparing sensitivity, specificity, positive predictive value, and negative predictive value between the cut-off found in the study versus KDIGO (Kidney Disease : Improving Global Outcomes) for evaluation of nephrotic-range proteinuria and complete remission.

**Method:** This study is a cross-sectional study with diagnostic tests involving 96 24-hour urine samples and urine samples taken from children with nephrotic syndrome aged 318 years. The subjects of the study were not only taking urine samples for 24-hour storage of urine protein and urine protein/creatinine ratio, as well as anthropometric examination to determine nutritional status. Analysis used the ROC curve to determine the optimal cut-off of urinary protein/creatinine ratio while evaluating nephrotic-range proteinuria and complete remission in our study, then calculated the values of sensitivity, specificity, positive predictive value, and negative predictive value and compared their values with the cut-off values set by KDIGO.

**Result:** The optimal cut-off of the urinary protein/creatinine ratio during our study for the evaluation of proteinuria that characterized complete remission was  $<0,4$  g/g and that of nephrotic-range proteinuria (no remission/relapse) was  $>1,5$  g/g. Comparison of the values of sensitivity, specificity, PPV, and NPV between the cut-off ratio of urine protein/creatinine when  $<0,4$  g/g (study finding) were 80,1%, 82,3%, 89,1%, and 68,3% versus cut-off urinary protein/creatinine ratio at  $<0,2$  g/g (KDIGO) 95,2%, 44,1%, 75,6%, and 83,3%. Comparison of the values of sensitivity, specificity, PPV, and NPV between the cut-off ratio of urine protein/creatinine when  $>1,5$  g/g (study finding) for evaluation of nephrotic-range proteinuria 88,5%, 84,3%, 67,7%, and 95,2% versus cut-off urinary protein/creatinine ratio at  $>2$  g/g (KDIGO) 84,6%, 91,4%, 78,6%, and 94,1%.

**Conclusion:** The cut-off of the urine protein/creatinine ratio during the evaluation of nephrotic-range proteinuria (non-remitting/relapsed) in our study reinforces the cut-off that has been issued by KDIGO of  $>2$  g/g, while the cut-off for evaluation of complete remission is more higher value compared to KDIGO of  $<0,4$  g/g.