

ABSTRAK

REZKY ANDIKA PUTRY. **Analisis Kadar Serum Uromodulin dan Urine Albumin-Creatinine Ratio pada subjek dengan Penyakit Ginjal Kronis** (dibimbing oleh Yuyun Widangsih dan Fitriani Mangarengi)

Latar belakang: Penyakit ginjal kronis (PGK) merupakan masalah kesehatan global dengan prevalensi tinggi dan progresivitas yang sering berakhir pada gagal ginjal terminal sehingga memerlukan *kidney replacement therapy*. Penilaian fungsi ginjal umumnya bergantung pada eGFR dan albuminuria, namun keterlibatan komponen tubulointerstisial sering terabaikan. Serum uromodulin (sUmod), protein tubular yang diproduksi di lengkung Henle, berpotensi menjadi biomarker tambahan untuk menilai integritas tubulus ginjal.

Tujuan: Menilai kadar sUmod dan uACR pada pasien PGK, serta hubungannya dengan stadium penyakit.

Metode: Penelitian deskriptif-analitik dengan desain potong lintang dilakukan pada 57 subjek PGK di RS Wahidin Sudirohusodo Makassar. Subjek dipilih melalui consecutive sampling. Pemeriksaan sUmod dilakukan dengan metode ELISA, sedangkan data uACR diperoleh dari urin sewaktu dengan hasil semi-kuantitatif. Analisis data menggunakan uji Kruskal-Wallis, LSD, dan Chi-Square dengan signifikansi $p < 0,05$.

Hasil: Mayoritas subjek adalah laki-laki (59,6%) dengan usia rata-rata 57 ± 14 tahun. Stadium terbanyak adalah PGK stadium 5 (45,6%). Anemia ditemukan pada 94,7% subjek, dengan hipertensi (73,6%) dan DM tipe 2 (57,8%) sebagai komorbid dominan. Nilai uACR terbanyak pada kategori makroalbuminuria (56,1%), terutama pada stadium lanjut dan *end stage*. Rerata sUmod 1,08 ng/mL menunjukkan tren penurunan seiring peningkatan stadium, meskipun perbedaan antar stadium tidak signifikan ($p > 0,05$).

Kesimpulan: Kombinasi uACR dan sUmod mencerminkan keterlibatan glomerulus maupun tubulus pada PGK. uACR meningkat, sedangkan sUmod menurun sesuai progresivitas penyakit, meski tanpa perbedaan signifikan berdasarkan stadium. Integrasi kedua biomarker ini berpotensi memberikan gambaran yang lebih komprehensif mengenai status dan progresi PGK.

Kata kunci: Penyakit ginjal kronis, uromodulin, serum uromodulin, tamm-horsfall protein, sUmod, urine albumine-creatinine ratio, uACR, progresivitas

ABSTRACT

REZKY ANDIKA PUTRY. **Analysis Level of Serum Uromodulin and Urine Albumin Creatinine-Ratio in Subjects with Chronic Kidney Disease**(supervised by Yuyun Widaningsih and Fitriani Mangarengi)

Backgrounds: Chronic kidney disease (CKD) is a major global health issue with increasing prevalence and progression that often leads to end-stage renal disease and need for kidney replacement therapy. Current assessments mainly rely on estimated glomerular filtration rate (eGFR) and albuminuria that measured with urine albumin-creatinine ratio (uACR), however, tubular involvement is often underrecognized. Serum uromodulin (sUmod), a glycoprotein secreted by tubular cells in the thick ascending limb of Henle, has been proposed as a novel biomarker reflecting tubular integrity and nephron mass.

Aims: This study aimed to investigate the levels of sUmod and uACR in CKD patients and to evaluate their association with CKD stages.

Methods: A cross-sectional descriptive-analytic study was conducted on 57 subject diagnosed with CKD at Wahidin Sudirohusodo Hospital, Makassar. Consecutive sampling was applied. Serum uromodulin levels were measured using the ELISA method, while uACR data was determined from spot urine samples using a semi-quantitative approach. Data were analyzed using the Kruskal-Wallis, Least Significant Difference, and Chi-Square tests, with statistical significance set at $p < 0.05$.

Results: The majority of participants were male (59.6%) with a mean age of 57 ± 14 years. CKD stage 5 was the most common (45.6%). Anemia was present in 94.7% of patients, while hypertension (73.6%) and type 2 diabetes (57.8%) were the most frequent comorbidities. More than half of the patients (56.1%) had macroalbuminuria, particularly in advanced CKD stages. Mean sUmod level was

1.08 ng/mL, showing a decreasing trend with disease progression, although no statistically significant differences were observed between stages ($p > 0.05$).

Conclusions: The combined assessment of uACR and sUmod reflects both glomerular and tubular involvement in CKD. Although stage-wise differences were not statistically significant, the progressive increase in uACR and decline in sUmod highlight their potential role as complementary biomarkers for evaluating CKD severity and progression.

Keywords: Chronic kidney disease, uromodulin, serum uromodulin, tamm-horsfall protein, sUmod, urine albumin-creatinine ratio, uACR ,progressivity