

**PERBEDAAN KADAR UROMODULIN DAN CYSTATIN C SERUM PADA
PENYAKIT GINJAL KRONIK STADIUM 1-3 DAN 4-5**



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ABSTRAK

PERBEDAAN KADAR UROMODULIN SERUM DAN CYSTATIN C SERUM PADA PENYAKIT GINJAL KRONIK STADIUM 1-3 dan 4-5

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Pendahuluan: Penyakit ginjal kronik (PGK) adalah gangguan ginjal yang ditandai dengan abnormalitas struktur dan atau fungsi ginjal selama lebih dari tiga bulan. Penyakit ginjal kronik merupakan penyakit yang memiliki prevalensi tinggi dan menjadi beban bagi pelayanan kesehatan. Uromodulin secara molekular adalah glikoprotein terkait *glikosil fosfatidilinositol* (GPI) yang disintesis dan ekskresi oleh sel epitel lengkung henle asenden. Penurunan ekskresi uromodulin disebabkan oleh penurunan nefron fungsional pada kondisi kerusakan ginjal. Cystatin C pertama kali digunakan pada tahun 1961 dan diberi nama resmi pada tahun 1984. Cystatin C adalah protein dasar non-glikosilasi yang dikodekan oleh gen CST3 yang ditemukan hampir disemua sel tubuh yang memiliki inti. Cystatin C dihasilkan secara konstan, difiltrasi secara bebas, diserap kembali dan dikatabolisme di tubulus proksimal.

Metode: Penelitian ini merupakan suatu penelitian observasional analitik dengan pendekatan *cross-sectional* yang dilaksanakan di Poli rawat jalan dan rawat inap RSUP Dr. M. Djamil Padang. Subjek penelitian yang sesuai dengan kriteria inklusi dan eksklusi berjumlah 46 sampel. Dilakukan pemeriksaan kadar *uromodulin dan cystatin C* serum menggunakan metode *enzyme-linked immunosorbent assay* (ELISA). Data dianalisis menggunakan uji beda untuk membedakan kadar uromodulin dan cystatin c serum pada penyakit ginjal kronik stadium 1-3 dan 4-5

Hasil: Rerata kadar uromodulin PGK stadium 1-3 sebesar 68,99 ng/ml dan pasien PGK stadium 4-5 sebesar 47,09 ng/ml dan kadar Cystatin C pada pasien PGK stadium 1-3 sebesar 0,49 mg/dl dan pasien PGK stadium 4-5 sebesar 1,04 mg/dl. Uji t tidak berpasangan menunjukkan perbedaan kadar uromodulin dan cystatin c yang bermakna secara statistik dengan nilai ($p < 0,001$)

Kesimpulan: Terdapat Perbedaan Kadar Uromodulin dan Cystatin C serum yang bermakna pada pasien penyakit ginjal kronik stadium 1-3 dan 4-5

Kata Kunci: Penyakit Ginjal Kronik , Uromodulin dan Cystatin C.

ABSTRACT

COMPARISON OF SERUM UROMODULIN AND SERUM CYSTATIN C LEVELS IN CHRONIC KIDNEY DISEASE STAGES 1–3 AND 4–5

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Background: Chronic kidney disease (CKD) is defined as a structural and/or functional abnormality of the kidneys persisting for more than three months. CKD is a highly prevalent condition and represents a significant burden on healthcare systems. Uromodulin, also known as Tamm-Horsfall protein, is a glycosylphosphatidylinositol (GPI)-anchored glycoprotein synthesized and secreted by epithelial cells of the thick ascending limb of the loop of Henle. A decline in uromodulin excretion reflects the loss of functional nephrons, commonly seen in progressive renal injury. Cystatin C, first introduced in 1961 and officially named in 1984, is a low molecular weight, non-glycosylated basic protein encoded by the CST3 gene, and is ubiquitously expressed in all nucleated cells. It is produced at a constant rate, freely filtered by the glomerulus, and undergoes complete reabsorption and catabolism in the proximal tubules

Methods: This was an analytical observational study employing a cross-sectional design, conducted in both outpatient and inpatient settings at Dr. M. Djamil Central General Hospital, Padang. A total of 46 subjects meeting the inclusion and exclusion criteria were enrolled. Serum uromodulin and cystatin C levels were measured using the enzyme-linked immunosorbent assay (ELISA) technique. Statistical analysis was performed using an independent t-test to compare the mean levels of serum uromodulin and cystatin C between CKD stages 1–3 and stages 4–5.

Results: The mean serum uromodulin level in patients with CKD stages 1–3 was 68.99 ng/ml, whereas in those with stages 4–5 it was 47.09 ng/ml. The mean serum cystatin C level in CKD stages 1–3 was 0.49 mg/dl, increasing to 1.04 mg/dl in stages 4–5. Independent t-test analysis demonstrated a statistically significant difference in serum levels of both biomarkers between the two CKD groups ($p < 0.001$).

Conclusion: There is a statistically significant difference in serum uromodulin and cystatin C levels between patients with CKD stages 1–3 and those with stages 4–5, indicating their potential utility in assessing disease progression.

Keywords: Chronic Kidney Disease, Uromodulin, Cystatin C.