

ABSTRAK

**HUBUNGAN ANTARA KADAR HIGH-SENSITIVITY C-REACTIVE PROTEIN (hs-CRP) SERUM DAN DERAJAT ALBUMINURIA YANG DIUKUR DENGAN ALBUMIN-TO-CREATININE RATIO (ACR) URINE PADA PASIEN DIABETES MELITUS TIPE 2**

**Penelitian Observasional Analitik Potong Lintang**

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**Latar Belakang:** Insidensi dan prevalensi diabetes melitus (DM) tipe 2 meningkat secara signifikan di seluruh dunia. Salah satu komplikasi DM tipe 2 yang membutuhkan biaya perawatan kesehatan yang tinggi adalah penyakit ginjal diabetik (PGD), yang ditandai dengan albuminuria, penurunan GFR, atau keduanya. Studi menunjukkan hubungan positif antara DM tipe 2 dan peningkatan hs-CRP serum, sebuah petanda inflamasi subklinis kronis. Namun demikian, hubungan antara kadar hs-CRP serum dan albuminuria masih diperdebatkan.

**Tujuan:** Menganalisis hubungan antara kadar hs-CRP serum dan derajat albuminuria yang diukur dengan ACR urine pada pasien DM tipe 2.

**Metode:** Penelitian ini dilakukan pada pasien DM tipe 2 di Poliklinik Endokrin, Metabolik, dan Diabetes RSUD Dr. Soetomo Surabaya periode Juni-Juli 2020. Kadar hs-CRP serum diperiksa dengan alat *Prestige Nefleton 24-I* ® *Specific Protein Analyzer*, sedangkan ACR urine diperiksa dengan alat *Roche/Hitachi* ® *Cobas C 501 Analyzer*. Kadar hs-CRP serum dan derajat albuminuria dianalisis secara statistik menggunakan uji korelasi *rank* Spearman.

**Hasil:** Penelitian ini melibatkan 50 pasien DM tipe 2, yang terdiri dari 25 orang (50%) pria dan 25 orang (50%) wanita, dengan median usia 58,0 (42-68) tahun dan rata-rata IMT  $21,91 \pm 1,310$  kg/m<sup>2</sup>. Median lama menderita DM adalah 12,0 (6-22) tahun, median kadar HbA1c 7,20 (5,7-12,3)%, rata-rata nilai BUN  $17,30 \pm 2,675$  mg/dL, rata-rata kadar kreatinin serum  $0,83 \pm 0,180$  mg/dL, dan median nilai eGFR 92,85 (61,6-121,2) mL/menit/1,73 m<sup>2</sup>. Median kadar hs-CRP serum didapatkan sebesar 1,20 (0,1-4,0) mg/L dan median nilai ACR urine sebesar 49,570 (7,78-426,00) mg/g. Pada subjek yang terlibat didapatkan 14 orang (28%) dengan normoalbuminuria, 33 orang (66%) mikroalbuminuria, dan 3 orang (6%) makroalbuminuria. Didapatkan hubungan positif dan signifikan antara kadar hs-CRP serum dan derajat albuminuria ( $r = 0,701$ ;  $p = <0,001$ ).

**Kesimpulan:** Terdapat hubungan positif dan signifikan antara kadar hs-CRP serum dan derajat albuminuria pada pasien DM tipe 2.

**Kata Kunci:** hs-CRP serum, albuminuria, ACR urine, diabetes melitus tipe 2.

**ABSTRACT**

***CORRELATION BETWEEN SERUM HIGH-SENSITIVITY C-REACTIVE PROTEIN (hs-CRP) LEVEL AND SEVERITY OF ALBUMINURIA MEASURED BY URINE ALBUMIN-TO-CREATININE RATIO (ACR) IN TYPE 2 DIABETIC PATIENTS***

***Cross-Sectional Analytic Observational Study***

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***Background:*** *The incidence and prevalence of type 2 diabetes mellitus (DM) increase significantly worldwide. One of complications in type 2 DM that require high treatment cost is diabetic kidney disease (DKD), which is characterized by the presence of albuminuria, decrease in glomerular filtration rate, or both. Researches show a positive correlation between type 2 DM and serum hs-CRP level, a sensitive marker of subclinical inflammation. However, correlation between hs-CRP serum level and severity of albuminuria is still unclear.*

***Objectives:*** *To analyze the correlation between serum hs-CRP level and severity of albuminuria measured by urine ACR in type 2 diabetic patients.*

***Methods:*** *This study was conducted at the Endocrinology Outpatient Clinic of Dr. Soetomo General Academic Hospital in June-July 2020. Serum hs-CRP level was measured by using Prestige Nefleton 24-I ® Specific Protein Analyzer, while urine ACR value was measured by using Roche/Hitachi ® Cobas C 501 Analyzer. Serum hs-CRP level and severity of albuminuria was then analyzed statistically using Spearman's rank correlation test.*

***Results:*** *This study included 50 patients with type 2 DM, consisting of 25 (50%) men and 25 (50%) women, with median age of 58.0 (42-68) years and mean BMI of  $21.91 \pm 1.310$  kg/m<sup>2</sup>. Median duration of DM was 12.0 (6-22) years, median HbA1c level was 7.20 (5.7-12.3)%, mean BUN level was  $17.30 \pm 2.675$  mg/dL, mean serum creatinine level was  $0.83 \pm 0.180$  mg/dL, and median eGFR value was 92.85 (61.6-121.2) mL/minute/1.73 m<sup>2</sup>. Median serum hs-CRP level was 1.20 (0.1-4.0) mg/L and median urine ACR value was 49.570 (7.78-426.00) mg/g. Normoalbuminuria was detected in 14 (28%) subjects, microalbuminuria in 33 (66%) subjects, and macroalbuminuria in 3 (6%) subjects. This study showed positive and significant correlation between serum hs-CRP level and severity of albuminuria ( $r = 0.701$ ;  $p = <0,001$ ).*

***Conclusion:*** *There was positive and significant correlation between serum hs-CRP level and severity of albuminuria in type 2 diabetic patients.*

***Keywords:*** *serum hs-CRP level, albuminuria, urine ACR, type 2 diabetes.*