

ABSTRAK

HUBUNGAN LAMA KERJA DENGAN KADAR *URINE ALBUMIN-CREATININE RATIO* (UACR) DAN NILAI ESTIMASI LAJU FILTRASI GLOMERULUS (eLFG)

Studi Kasus pada Petugas Stasiun Pengisian Bahan Bakar Umum (SPBU)

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Latar Belakang : Petugas SPBU di negara berkembang berisiko tinggi mengalami gangguan ginjal akibat paparan kronis uap bensin, terutama benzena, melalui mekanisme stres oksidatif. Studi pendahuluan di Semarang Selatan menemukan 9,97% petugas SPBU mengalami proteinuria, sehingga diperlukan penelitian lebih lanjut mengenai hubungan lama kerja dengan kadar *urine albumin-creatinine ratio* (uACR) dan estimasi laju filtrasi glomerulus (eLFG) sebagai indikator awal penyakit ginjal kronik (PGK).

Metode : Penelitian ini menggunakan desain potong lintang (*cross-sectional*) pada 31 petugas SPBU Wilayah Semarang Selatan pada Maret 2022. Data dikumpulkan melalui kuesioner, pemeriksaan fisik, serta analisis sampel urin dan darah. Pemeriksaan uACR dilakukan dari urin pancar tengah, dan nilai eLFG dihitung dengan rumus CKD-EPI. Analisis statistik menggunakan uji korelasi spearman, uji beda, dan uji *pearson chi-square*.

Hasil : Median lama kerja subjek adalah 7 tahun. Median kadar uACR sebesar 58,68 mg/g dan rerata nilai eLFG sebesar $98,06 \pm 23,26$ mL/ mnt/1,73 m². Tidak ditemukan korelasi bermakna antara lama kerja dan kadar uACR ($p=0,442$). Terdapat korelasi negatif derajat sedang antara lama kerja dan nilai eLFG ($p=0,002$; $r=-0,538$). Uji *independent sample t-test* menunjukkan perbedaan signifikan pada rerata nilai eLFG berdasarkan kategori lama kerja ($p=0,009$) dan uji *pearson chi-square* menunjukkan hubungan bermakna antara kategori lama kerja dan kategori nilai eLFG dengan rasio prevalensi 2,65 ($p=0,036$; RP=2,65; 95% CI: 0,919 – 7,633)

Kesimpulan : Lama kerja tidak memiliki hubungan bermakna dengan kadar uACR, namun memiliki hubungan yang bermakna dengan nilai eLFG.

Kata Kunci : Lama Kerja, uACR, eLFG, Bensin, PGK, SPBU

ABSTRACT

OCCUPATIONAL EXPOSURE TO GASOLINE VAPORS: ASSOCIATION BETWEEN EMPLOYMENT DURATION AND URINARY ALBUMIN-CREATININE RATIO (UACR) AND ESTIMATED GLOMERULAR FILTRATION RATE (EGFR) A Case Study Among Fuel Station Workers in South Semarang

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Background : Fuel station workers in developing countries are at increased risk of kidney damage due to long-term exposure to gasoline vapors, especially benzene, which can cause oxidative stress. A preliminary study in South Semarang indicated a 9.97% of fuel station workers had proteinuria, suggesting early signs of kidney injury. These findings underscore the need for further investigation into the association between duration of occupational exposure and urinary albumin-creatinine ratio (uACR) and estimated glomerular filtration rate (eGFR) which are critical markers in the early detection of chronic kidney disease (CKD).

Methods : A cross-sectional analytical study was conducted in March 2022 involving 31 fuel station workers from the South Semarang. Data collection included structured questionnaires, physical examinations, and laboratory assessments of midstream urine and venous blood samples. uACR was quantified via standard biochemical analysis, and eGFR was calculated using the CKD-EPI formula. Statistical analyses were performed using the spearman correlation test, comparative test, and the pearson chi-square test.

Results : The median duration of employment was 7 years. The median uACR was 58.68 mg/g, and the mean eGFR was 98.06 ± 23.26 mL/min/1.73 m². No statistically significant correlation was observed between duration of employment and uACR levels ($p=0.442$). In contrast, a statistically significant moderate negative correlation was observed between duration of employment and eGFR ($p=0.002$; $r=-0.538$). The independent sample t-test demonstrated a statistically significant difference in the mean eGFR scores based on employment duration categories ($p=0.009$). Furthermore, the pearson chi-square test identified a significant association between employment duration categories and eGFR categories, with a prevalence ratio (RP) of 2.65 ($p=0.036$; 95% CI: 0.919 – 7.633)

Conclusion : Employment duration was not significantly correlated with uACR levels; however, it demonstrated a statistically significant association with eGFR values.

Keywords : Occupational Exposure, uACR, eGFR, Gasoline, CKD, Fuel Station