

## **Korelasi antara Kriteria *Acute Kidney Injury* (AKI) : RIFLE, AKIN, dan KDIGO dengan Angka Kematian pada Pasien Sepsis di ICU RSUP DR.**

### **Sardjito**

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### **INTISARI**

**Latar Belakang :** Sepsis adalah penyebab 50% kasus *Acute Kidney Injury* (AKI) pada pasien kritis di *Intensive Care Unit* (ICU). Angka kematian akibat AKI sekitar 50%. Kriteria AKI didasarkan pada pengkajian tingkat keparahan berdasarkan lab serum kreatinin dan produksi urin dan dibedakan menjadi: *Risk Injury Failure Loss End Stage* (RIFLE), *Acute Kidney Injury Network* (AKIN), dan *Kidney Disease and Improving Global Outcomes* (KDIGO). Dari beberapa kriteria AKI ini, yang tingkat keparahannya paling tinggi diperoleh pada kategori Failure pada kriteria RIFLE, stage 3 pada kriteria AKIN dan KDIGO. Angka kematian pada pasien sepsis dengan AKI di ICU juga berkorelasi dengan beberapa faktor seperti usia, jenis kelamin, Indeks Massa Tubuh (IMT), *Mean Arterial Pressure* (MAP), komorbid seperti COPD, CHF, DM, dan HT, *SOFA Score*, *Vasopressor*, Laktat, Hemodialisa dan *Procalcitonin*.

**Tujuan :** Tujuan penelitian ini adalah mengetahui korelasi antara kriteria AKI : RIFLE, AKIN, dan KDIGO dengan angka kematian pada pasien sepsis serta faktor-faktor yang berpengaruh terhadap mortalitas pasien AKI.

**Metode Penelitian :** Penelitian ini merupakan penelitian deskriptif analitik kohort retrospektif, menggunakan data sekunder dari rekam medis di Rumah Sakit Dr. Sardjito Yogyakarta dari bulan Januari 2020 sampai dengan Desember 2023. Analisis data dilakukan dengan menggunakan aplikasi pengolah data statistik. Untuk mengetahui demografi dan karakteristik subjek penelitian digunakan analisis deskriptif frekuensi untuk data numerik. Lalu dilakukan uji normalitas data dengan uji *Kolmogorov Smirnov*. Analisa bivariate dianalisis dengan uji Korelasi Spearman. Analisis multivariat dilakukan dengan Uji Regresi Logistik. Untuk mengetahui kualitas diskriminasi kriteria AKI antara RIFLE, AKIN, dan KDIGO, dinilai dengan melihat *Area under Curve* (AUC) dengan metode *Receiver Operating Curve* (ROC). Diskriminasi baik jika nilai AUC mendekati angka 1.

**Hasil :** Terdapat 86 sampel pada penelitian ini. Pada analisis bivariate, kriteria AKI dengan angka kematian didapatkan hasil  $p < 0.05$ , menunjukkan bahwa kriteria AKI terdapat korelasi dengan angka kematian pada pasien sepsis. Analisis *multivariate* didapatkan kriteria AKI signifikan dengan angka kematian  $p = 0.038$ . Kriteria AKI Failure (OR=12.54, CI 95%=1,15-136.663). Faktor lain yang berpengaruh terhadap kematian adalah jenis kelamin perempuan (OR=7.24, CI 95%= 1.003-52.25), COPD (OR=33.15, CI 95%= 3.054-359.771), DM (OR=6.21, CI 95%=1.124-34.343), dan laktat (OR=2.51, CI 95%=1.49-4.242). Hasil analisis *Receiver Operating Curve* (ROC) kriteria AKI : RIFLE, AKIN), dan KDIGO memiliki kualitas diskriminasi sama besar yaitu nilai *Area under*

*Curve* (AUC)=0.759 ( $p<0.001$ ), menunjukkan terdapat korelasi dengan angka kematian pada pasien sepsis.

**Kesimpulan :** Terdapat korelasi antara kriteria AKI : RIFLE, AKIN, dan KDIGO dengan angka kematian pasien sepsis di ICU.

**Kata Kunci :** AKI, AKIN, Angka Kematian, KDIGO, RIFLE, *Sepsis*

## **Correlation between *Acute Kidney Injury* (AKI) Criteria : RIFLE, AKIN, and KDIGO and Death Rate in *Sepsis* Patients in the ICU of Dr. Sardjito**

### **Hospital**

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### **ABSTRACT**

**Background:** *Sepsis* is the cause of 50% of *Acute Kidney Injury* (AKI) cases in critical patients in the Intensive Care Unit (ICU). The death rate due to AKI is around 50%. AKI criteria are based on an assessment of severity based on serum creatinine lab and urine production and are divided into: Risk Injury Failure Loss End Stage (RIFLE), *Acute Kidney Injury* Network (AKIN), and Kidney Disease and Improving Global Outcomes (KDIGO). Of the several AKI criteria, the highest level of severity is obtained in the Failure category in the RIFLE criteria, stage 3 in the AKIN and KDIGO criteria. The mortality rate in sepsis patients with AKI in the ICU is also correlated with several factors such as age, gender, Body Mass Index (BMI), Mean Arterial Pressure (MAP), comorbidities such as COPD, CHF, DM, and HT, SOFA Score, Vasopressor, Lactate, Hemodialysis and Procalcitonin.

**Objective:** The aim of this study was to determine the correlation between AKI criteria: Risk Injury Failure Loss End Stage (RIFLE), *Acute Kidney Injury* Network (AKIN), and Kidney Disease and Improving Global Outcomes (KDIGO) with the risk of death in sepsis patients and factors that influence the mortality of AKI patients.

**Research Methods:** This research is a retrospective cohort analytical descriptive study, using secondary data from medical records at Dr. Sardjito Yogyakarta from January 2020 to December 2023. Data analysis was carried out using statistical data processing applications. To determine the demographics and characteristics of research subjects, descriptive frequency analysis was used for numerical data. Then the data normality test was carried out using the Kolmogorov Smirnov test. Bivariate analysis was analyzed using the Spearman Correlation test. Multivariate analysis carried out using the Logistic Regression Test. To determine the quality of discrimination of AKI criteria between RIFLE, AKIN, and KDIGO, it was assessed by looking at the Area under Curve (AOC) using the *Receiver Operating Curve* (ROC) method. Good discrimination if the AUC value is close to 1.

**Results:** There were 86 samples in this study. In the bivariate analysis, the AKI criteria with a mortality rate were found to be  $p < 0.05$ , indicating that the AKI criteria were correlated with the mortality rate in sepsis patients. Multivariate analysis showed that the AKI criteria were significant with a mortality rate of  $p = 0.038$ . Criteria for AKI Failure (OR=12.54, CI 95%=1.15-136.663). Other factors that influence mortality are female gender (OR=7.24, CI 95%= 1.003-52.25), COPD (OR=33.15, CI 95%= 3.054-359.771), DM (OR=6.21, CI 95%=1.124-34.343), and lactate (OR=2.51, CI 95%=1.49-4.242).. The results of the *Receiver Operating Curve* (ROC) analysis of the AKI criteria: RIFLE, AKIN), and KDIGO have the same discriminatory quality, namely the *Area Under Curve*

(AUC) value=0.759 ( $p<0.001$ ), indicating that there is a correlation with the death rate in sepsis patients.

**Conclusion:** There is a correlation between AKI criteria: RIFLE, AKIN, and KDIGO with the mortality rate of sepsis patients in ICU.

**Keywords:** AKI, AKIN, KDIGO, Mortality Rate, RIFLE , *Sepsis*