

Abstract Submission No.: A-0753

Correlation Between Hemodialysis Adequacy and Hemoglobin Levels in Patients with Chronic Kidney Disease

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Objectives : Anemia is a prevalent complication in chronic kidney disease (CKD) patients undergoing hemodialysis, significantly impacting their quality of life and clinical outcomes. Adequate hemodialysis, measured by parameters like Kt/V, is crucial for removing uremic toxins and potentially improving hemoglobin levels. While previous studies have explored this association, findings remain inconclusive, particularly in the Indonesian context. This study aimed to investigate the correlation between hemodialysis adequacy and hemoglobin levels in CKD patients undergoing hemodialysis using data from the Indonesian Renal Registry (IRR) in Surakarta Region.

Methods : A cross sectional study was conducted using IRR data from January-December 2021. Patients aged >18 years diagnosed with CKD and undergoing regular hemodialysis were included. Hemoglobin levels, Kt/V values, and relevant demographic and clinical data were extracted. Pearson's rank correlation coefficient was employed to assess the correlation between hemodialysis adequacy (Kt/V) and hemoglobin levels. Linear regression analysis was further performed to control for potential confounding factors.

Results : A total of 115 patients were included in analysis data. The mean age was 49.28 ± 10.47 years, and 51.3% were female. The most common comorbidity caused CKD was Hypertension (92.2%). The average hemoglobin level was 7.92 ± 1.76 g/dL. Significant positive correlations were observed between Kt/V (correlation = 0.535, p = <0.05) with hemoglobin levels. Linear regression analysis confirmed these associations, with higher Kt/V values independently predicting higher hemoglobin levels (p < 0.05).

Conclusions : This study demonstrates a significant positive correlation between hemodialysis adequacy, measured by Kt/V, and hemoglobin levels in CKD patients on hemodialysis in Indonesia. Optimizing hemodialysis adequacy may therefore offer a potential strategy for improving anemia management and clinical outcomes in this population.

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Table 1. Patient's Characteristic Based on Age, HD Duration, HD Adequacy, and Hemoglobin

Variabel	N	Minimum	Maximum	Mean	Standar Deviasi
Age (years)	115	30	79	49,29	10,478
HD Adequacy (Kt/v)	115	0,9	2,7	1,458	0,3444
Hemoglobin (g/dL)	115	1,0	13,2	7,929	1,7615

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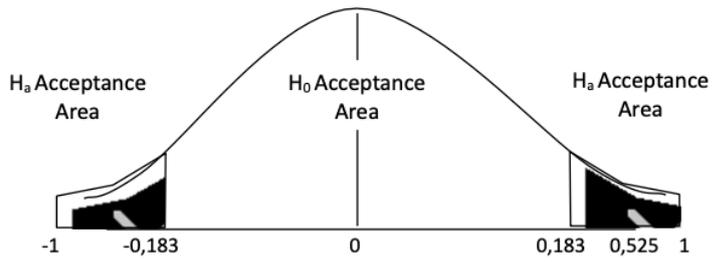


Fig. 1. Curve showed relationship between HD Adequacy and Hemoglobin (0.535 = moderate)