

Associated Factors with Erectile Dysfunction in Hemodialysis Patients at Dr. Reksodiwiryo Hospital Padang

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ARTICLE INFO	ABSTRACT
<p><i>Article history:</i> Received: October 31, 2025 Accepted: December 10, 2025 Published Online: December 24, 2025</p> <hr/> <p><i>Corresponding Author:</i> Harnavi Harun, Nephrology Division RSUP Dr. M. Djamil, Padang, West Sumatra, Indonesia, harnavi@med.unand.ac.id</p>	<p>Background: Erectile dysfunction (ED) is a common condition affecting a significant number of men worldwide, with its prevalence particularly high among patients with chronic kidney disease (CKD).</p> <p>Objective: This study aims to investigate the association between ED and CKD in patients undergoing hemodialysis.</p> <p>Methods: This study used a survey approach, designed with cross-sectional involving 24 male patients undergoing hemodialysis at the hospital from January to July 2024. Data were gathered using the IIEF-5 questionnaire as well as patient records. The severity of ED was classified based on IIEF-5 scores, and data analysis was conducted using SPSS.</p> <p>Results: Most respondents (58.3%) were under 60 years old, with 58.3% having hemoglobin levels below 10 g/dL and 79.2% with a KT/V ratio under 1.8. ED prevalence was high at 95.8%, with severe ED affecting 54.2%. A significant correlation existed between KT/V and ED severity $p < 0.05$, while hemoglobin levels showed no significant association $p > 0.05$. The high prevalence of ED in CKD patients undergoing hemodialysis highlights the importance of regular screening and early intervention. The study indicates that sufficient hemodialysis, as measured by the Kt/V ratio, could be essential in reducing the severity of ED in this group. However, hemoglobin levels did not show a significant connection to ED severity, which contrasts with certain earlier research findings.</p> <p>Conclusion: Erectile dysfunction is common among CKD patients undergoing hemodialysis, with insufficient dialysis being a key contributing factor. This highlights the need to maintain adequate dialysis to reduce the severity of ED in these individuals.</p> <p>Keywords: Chronic Kidney Disease, Erectile dysfunction, Hemodialysis.</p>

Introduction

Erectile dysfunction (ED) is a condition characterized by difficulty in achieving or maintaining an erection sufficient for satisfactory sexual activity. The disorder is relatively common and is estimated to affect around 150 million men worldwide, with incidence rates continuing to rise. It is projected that by 2025, the number of men experiencing ED could reach 300 million, almost double the current number. The factors contributing to this condition are diverse, ranging from ageing to metabolic disorders such as

hypertension, diabetes, and hyperlipidemia, as well as smoking, which has long been associated with sexual dysfunction. In addition, recent studies have shown that chronic kidney disease (CKD) also acts as a significant risk factor in the development of ED, adding complexity to its treatment and prevention. Therefore, understanding the various factors that trigger ED is important to devise more effective prevention and treatment strategies.¹ In uremic patients, vascular issues, along with decreased libido due to hormonal changes and fluctuations, such as a

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reduced frequency of sexual activity, are significant contributing factors. Erectile dysfunction has emerged as a significant concern for patients with compromised renal function, as evidenced by recent research that relates hormonal and erectile problems with renal function. Similar to the cardiovascular system, renal function is frequently correlated with hormonal and ED.²

Navaneethan et al., in their meta-analysis, revealed that the average prevalence of ED in patients with CKD is as high as 70%, suggesting that this condition is a common complication. Furthermore, a study conducted by Mesquita et al. found that the prevalence rate of ED varied based on the stage of CKD, with 72.3% in stage 3 patients, increasing to 81.5% in stage 4, and reaching 85.7% in stage 5. Similar results were also reported by Nassir, who noted that 82.7% of patients newly starting dialysis therapy had erectile dysfunction. These findings indicate that the more advanced the stage of CKD, the higher the risk of erectile dysfunction, which in turn can impact patients' quality of life.³⁻⁵

Chronic kidney disease causes serious health problems and puts a heavy strain on healthcare budgets as more patients are diagnosed over time.⁶ The standard test for CKD, measuring serum creatinine levels, may not detect the disease early because the kidneys can handle damage for a while. Even when creatinine levels start to rise, noticeable symptoms usually do not appear until kidney function falls to 20–30%.⁷ Early diagnosis is important because simple measures can significantly slow the disease's progress. Thus, there is a need for better early detection markers to diagnose CKD early and prevent it from reaching advanced stages.

This study seeks to assess whether ED can function as an early clinical indicator of CKD. Patients with ED will be evaluated for CKD to determine if ED could signal an early warning, with the objective of preventing or delaying the advancement to end-stage renal failure.

Methods

Design and participants

The study employed a cross-sectional approach to examine the association between ED and different factors in male patients receiving hemodialysis. Carried out at Dr. Reksodiwiryo Hospital, the research took place over a period of seven months, from January to July 2024. Participants were chosen through a consecutive sampling method to achieve a thorough representation of the target population.

Data in this study were obtained through the International Index of Erectile Function (IIEF-5) questionnaire, which classifies erectile dysfunction (ED) into five categories based on a score scale, namely normal (26-30), mild (22-25), mild to moderate (17-21), moderate (11-16), and severe (0-10). This questionnaire was used to assess the severity of ED in respondents more systematically and measurably. This study aims to explore the relationship between ED and various clinical factors, such as age, hemoglobin (Hb) level, and KT/V ratio, which play a role in measuring the effectiveness of the hemodialysis process in patients.

Study Covariate

The study examined various covariates to determine their relationship with ED in male patients undergoing hemodialysis. Age was identified as a key factor and was divided into two groups: those younger than 60 years and those 60 years or older. Hemoglobin levels, a crucial measure of oxygen transport in the blood, were categorized as either below 10 mg/dl or 10 mg/dl and above. Hemodialysis effectiveness was evaluated using the KT/V ratio, which reflects urea clearance in relation to its distribution volume, with thresholds set at less than 1.8 and 1.8 or higher. ED severity as the primary outcome was evaluated using the International Index of Erectile Function (IIEF-5) and categorized into five levels: normal (26-30), mild (22-25), mild to moderate (17-21), moderate (11-16), and severe (0-10). The covariates used were selected based on their clinical significance as well as their possible impact on ED, thus providing a comprehensive approach to analyzing the factors

influencing sexual dysfunction in this patient group.

Statistical analysis

Data analysis in this study was conducted using SPSS version 22.0 software to systematically process and interpret the data. Descriptive statistics were applied to summarize the characteristics of the study population, including age, hemoglobin (Hb) level, KT/V ratio, and severity of erectile dysfunction (ED). In this analysis, continuous variables were presented as means and standard deviations, while categorical variables were presented as frequency distributions and percentages. To evaluate the relationship between the categorical variables, the Chi-Square test was used, which allowed identification of significant associations between age, Hb level, KT/V ratio, and ED severity. The results of the analysis were considered statistically significant when the p-value was less than 0.05, indicating that the observed association was not the result of chance alone. As such, this test plays an important role in determining whether variations in ED severity

are significantly associated with physiological factors such as age, hemoglobin level, or KT/V ratio. This analysis aims to identify the main factors contributing to ED in patients undergoing hemodialysis and assess their clinical relevance in improving patients' quality of life.

Results

Patient selection

This study involved 24 male patients undergoing hemodialysis at Dr. Reksodiwiryo Hospital, selected through consecutive sampling between January and July 2024. Erectile dysfunction severity was evaluated using the International Index of Erectile Function (IIEF-5) questionnaire. Patient characteristics were analyzed concerning key factors such as age, Hb levels, and KT/V ratios, which assess dialysis adequacy. Ethical approval was secured to ensure adherence to research standards.⁸

The findings showed that 58.3% of patients were under 60 years old, while 41.7% were 60 years or older (Table 1).

Table 1. Characteristics of patients in our study

Respondent Characteristic	Frequency	Percentage
Age		
a. <60	14	58.3%
b. ≥60	10	41.7%
HB		
a. <10	14	58.3%
b. ≥10	10	41.7%
KT/V		
a. <1,8	19	79.2%
b. ≥ 1,8	5	20.8%
ED Stages		
a. Mild erectile dysfunction	3	12.5%
b. Mild to moderate erectile dysfunction	4	16.7%
c. Moderate erectile dysfunction	3	12.5%
d. No erectile dysfunction	1	4.2%
e. Severe erectile dysfunction	13	54.2%

In terms of hemoglobin levels, 58.3% had values below 10 mg/dl, whereas 41.7% had levels of 10 mg/dl or higher (Table 2).

Table 2. Distribution of Age and Erectile Dysfunction Grades

		ED Grades					total
		Mild erectile dysfunction	Mild to moderate erectile dysfunction	Moderate erectile dysfunction	No erectile dysfunction	Severe erectile dysfunction	
Age	<60	3 21.4%	4 28.6%	0 .0%	1 7.1%	6 42.9%	14 100.0%
	>= 60	0 .0%	0 .0%	3 30.0%	0 .0%	7 70.0%	10 100.0%
Total		3 12.5%	4 16.7%	3 12.5%	1 4.2%	13 54.2%	24 100.0%

The KT/V ratio analysis indicated that 79.2% of patients had values below 1.8, suggesting inadequate hemodialysis, while only 20.8% had ratios of 1.8 or higher (Table 3).

Table 3. Distribution of Hemoglobin and Erectile Dysfunction grades

		ED Grades					Total
		Mild erectile dysfunction	Mild to moderate erectile dysfunction	Moderate erectile dysfunction	No erectile dysfunction	Severe erectile dysfunction	
HB	<10	1 7.1%	1 7.1%	3 21.4%	0 .0%	9 64.3%	14 100.0%
	>= 10	2 20.0%	3 30.0%	0 10.0%	1 10.0%	4 40.0%	10 100.0%
Total		3 12.5%	4 16.7%	3 12.5%	1 4.2%	13 54.2%	24 100.0%

The severity of ED among participants was notable: 54.2% suffered from severe ED, 4.2% had no ED, and the remaining individuals experienced varying degrees of mild to moderate ED (Table 4).

Table 4. Distribution of KT/V and Erectile Dysfunction grades

		ED Grades					Total
		Mild erectile dysfunction	Mild to moderate erectile dysfunction	Moderate erectile dysfunction	No erectile dysfunction	Severe erectile dysfunction	
KT/V	<1.8	3 15.8%	3 15.8%	1 5.3%	0 .0%	12 63.2%	19 100.0%
	>= 1.8	0 .0%	1 20.0%	2 40.0%	1 20.0%	1 20.0%	5 100.0%
Total		3 12.5%	4 16.7%	3 12.5%	1 4.2%	13 54.2%	24 100.0%

Additional analysis revealed a significant correlation between KT/V ratios and ED severity, with a Chi-Square test p-value of 0.044 (Table 5).

Table 5. Association between KT/V and Erectile Dysfunction with Chi-Square

Asymp. Sig (2-sided)	
Pearson Chi- Square	0.044

Patients with lower KT/V ratios (<1.8) were more prone to severe ED. However, no statistically significant link was found between hemoglobin levels and ED severity, as indicated by a p-value of 0.148 (Table 6). Age also appeared to influence ED severity, with patients aged 60 years or older experiencing higher rates of severe ED than younger individuals. These results highlight the impact of dialysis adequacy and age on ED development in hemodialysis patients, while hemoglobin levels had a less pronounced effect.

Table 6. Association between Hemoglobin and Erectile Dysfunction with Chi-Square

Asymp. Sig (2-sided)	
Pearson Chi- Square	0.148

Discussion

This study offers valuable insights into the prevalence and contributing factors of ED in male patients undergoing hemodialysis. The results indicated a high occurrence of ED, with severe cases being the most common. Age and dialysis adequacy, assessed through KT/V ratios, were identified as key factors affecting ED severity, whereas hemoglobin levels showed no significant statistical association.

The strong correlation between KT/V ratios and ED severity underscores the vital role of dialysis adequacy in preserving sexual health among CKD patients. Those with KT/V values below 1.8 were more prone to severe ED, highlighting the necessity of optimizing dialysis to improve overall quality of life. This finding supports previous research indicating that

insufficient dialysis not only impacts general health but also worsens sexual dysfunction. Effective dialysis plays a crucial role in eliminating uremic toxins, which, if retained, can interfere with vascular and hormonal pathways essential for normal erectile function.⁹

Age was also strongly associated with ED severity, with patients aged 60 and older being more likely to experience severe ED than younger individuals. This finding aligns with previous research suggesting that age is a major risk factor for ED, largely due to age-related vascular and hormonal changes. The increased prevalence of severe ED among older patients highlights the importance of targeted interventions and counseling to effectively address sexual health concerns in this population.²

On the other hand, hemoglobin levels, despite being an indicator of anemia frequently linked to CKD, did not exhibit a significant association with ED severity. Although anemia can affect oxygen transport and vascular function, its direct influence on ED may be less substantial compared to factors like hormonal imbalances and dialysis adequacy. This finding is consistent with some studies suggesting that while anemia is common in CKD, it does not always directly correlate with sexual dysfunction. Further research with larger sample sizes and more in-depth evaluations of anemia's effects on vascular and hormonal function could provide greater clarity on this relationship.^{8,10}

The significant occurrence of severe ED in this study highlights the importance of comprehensive management strategies for CKD patients on hemodialysis. Efforts should prioritize optimizing dialysis adequacy, mitigating age-related risk factors, and implementing routine ED screening for early detection and treatment. Moreover, hormonal imbalances commonly seen in CKD, such as reduced testosterone levels and increased prolactin, should be further explored as potential therapeutic targets to enhance sexual function.¹¹

This study highlights the complexity of erectile dysfunction (ED) in hemodialysis patients, which is caused by the dynamic interaction between various physiological, vascular, and hormonal factors. This condition not only affects aspects of sexual health but also has a significant impact on patients' overall quality of life. Therefore, a comprehensive management approach, encompassing medical interventions, hormonal therapy, as well as treatment strategies focusing on cardiovascular health, is crucial to improve patient well-being.

Conclusion

The study revealed that ED remains highly prevalent among CKD patients undergoing regular hemodialysis. Several factors, including low Hb levels and shorter dialysis duration, contribute to the severity of ED by leading to inadequate dialysis. These findings offer valuable insights for physicians and healthcare professionals on the importance of these factors in determining ED severity in CKD patients receiving hemodialysis. However, further research using a prospective approach and minimizing bias is necessary to strengthen these conclusions.

Limitations of the Study

Future research should be directed towards prospective studies with larger sample sizes to strengthen the scientific evidence regarding the relationship between these factors and the effectiveness of various treatment methods.

Declarations

Ethics approval and consent to participate

This study adhered to the guidelines for the Declaration of Helsinki and received approval from the Ethics Committee of the Dr. Reksodiwiryo Hospital, Padang, Indonesia, under reference number B/250/VII/2024.

Competing interests

There are no conflicts of interest in writing this article.

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Author's Contribution

Idea/concept: AV, MP, EV, HH. Design: AV, MP, EV, HH. Control/supervision: AV, MP, EV, HH. Data collection/ processing: AV, MP, EV, HH. Analysis/interpretation: AV, MP, EV, HH. Literature review: AV, MP, EV, HH. Writing the article: AV, MP, EV, HH. Critical review: AV, MP, EV, HH. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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