

Prevalence and impact of pruritus among sudanese people with ESRD undergoing hemodialysis

Abstract

Background: Chronic kidney disease-associated pruritus (CKD-aP) is a frequent yet under-recognized symptom among patients with end-stage renal disease (ESRD) on hemodialysis (HD). It adversely affects quality of life, contributing to sleep disturbances, and physiological distress. This study aims to determine the prevalence, severity, and impact of CKD-aP among Sudanese ESRD patients at Kassala Teaching Hospital.

Methods: A total of 186 ESRD patients undergoing HD were enrolled in this study. Data was collected through structured interviews using a questionnaire covering demographics, CKD characteristics, and pruritus severity (assessed via the 5-D pruritus scale). Statistical analysis was performed using SPSS 21.

Results: Severe pruritus was reported by 17.1% of participants, with 20% experiencing significant sleep disturbances. CKD-aP severity was significantly associated with hypertension, BMI, and age group.

Conclusion: CKD-aP is prevalent among ESRD patients on HD in Sudan, negatively impacting quality of life. Routine screening and targeted strategies are recommended to improve patient well-being and outcomes.

Keywords: chronic kidney disease, pruritus, 5-d scale, sleep disturbance

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Abbreviations: CKD-AP, chronic kidney disease-associated pruritus; ESRD, end-stage renal disease; HD, hemodialysis

Introduction

ESRD is one of the leading causes of morbidity and mortality worldwide.¹ Over 1.1 million patients are estimated to have ESRD worldwide, with an addition of 7% annually.² In the USA, the incidence and prevalence counts are expected to increase by 44 and 85% respectively, from 2000 to 2015.³ The incidence in Sudan has been increasing in recent years,⁴ and the estimated prevalence of new cases in Sudan is about 70-140/million inhabitants/year.⁵

Pruritus is a common symptom in patients with end-stage renal disease (ESRD). In older series, up to 90% of patients were afflicted with pruritus, but now between 20% and 50% are affected.⁶ Pruritus occurs independent of the cause of the ESRD, and patients on both peritoneal and hemodialysis experience pruritus at similar rates. All races, both genders and all ages can develop ESRD pruritus.⁷ Nephrologists have recognized and documented significant impact of itch on ESRD patients' quality of life. In addition, pruritus is an independent predictor of increased mortality, probably because of effect on a patient's quality of sleep. The pathogenic basis of pruritus in renal failure is unknown. The renal failure must be severe to be associated with pruritus. The resolution of itch, albeit slowly in some cases, after renal transplantation suggests that a factor normally removed by the kidney but not effectively removed during dialysis is playing a role.⁸ The pruritus may be constant or intermittent. The back is the most commonly affected area, but arms, head, and abdomen are also commonly affected.⁹ Excoriations with no primary lesions,

and sparing of the butterfly area of the back is typical. Patients with ESRD, especially if attributable to diabetes mellitus, frequently develop keratotic nodules that on biopsy show a perforating disorder. These represent prurigo nodules and are a marker for severe and long-term pruritus.¹⁰ This study aims to assess the frequency and outcome of CKD associated pruritus among ESRD patients undergoing HD at Kassala teaching hospital, Sudan 2024.

Patients and methods

Study design

A descriptive cross-sectional study.

Study population

All adult patients of 18 years old and above who diagnosed with ESRD and were on maintenance hemodialysis for at least six months underwent regular hemodialysis at Kassala Teaching Hospital, Hemodialysis Centre from January to April 2024 and who agreed to participate in the study were included. Patients who receiving acute hemodialysis or not on maintenance hemodialysis were excluded.

Data collection tool

The data was collected through a comprehensive structural close-ended questionnaire include demographic information (age, gender, occupation, residence and body mass index), clinical characteristics of CKD, hemodialysis duration and potential ESRD risk factors, beside the validated 5-D Pruritus Scale for assessing severity and its impact on quality of life.

Structure of the 5-D Pruritus Scale

The 5-D Pruritus Scale evaluates five distinct dimensions of pruritus: Duration, Degree, Direction, Disability, and Distribution. Each dimension is assessed using a series of questions, with responses scored on a numerical scale to generate an overall pruritus score. The scale is composed of the following components:

- **Duration:** This dimension assesses the frequency of itching episodes over the past two weeks. Patients report the total of days during which they experienced pruritus.
- **Degree:** This measures the intensity or severity of itching. Patients rate the degree of pruritus on a scale ranging from mild to severe.
- **Direction:** Direction examines the trajectory of pruritus, specifically whether the condition has improved, worsened, or remained stable over the previous two weeks.
- **Disability:** This dimension evaluates the impact of pruritus on four areas of daily life: sleep, leisure/social activities, work/school, and housework/errands. Each area is rated on a scale from “no impact” to “severe impact.”
- **Distribution:** Patients are asked to indicate the areas of the body affected by pruritus. A body map is typically used for this purpose, and scores are based on the number of affected regions.¹¹

Results

This study included 186 ESRD patient at regular hemodialysis at Kassala Teaching Hospital, Hemodialysis Centre. The characteristic of participants was represented in Tables 1–5.

Table 1 Descriptive data of the study group

Variable	Frequency
Gender	
Male	106 (57.2%)
Female	80 (42.8%)
Ageyears (mean age=49)	
15-35	40 (21.5%)
36-55	81 (43.5%)
56-75	62(33.3%)
>75	3 (1.6%)
Bmi(kg/m2) (bmi = (weight in kg) / (height in m)) 2	
<18(Underweight)	42 (22.5%)
18-25(Normal)	114 (61.5%)
25-30 (Overweight)	30 (15.5%)
30-35(Obese class 1)	1 (0.5%)
Duration of hemodialysisyears	
Less than one year	45 (24.1%)
5-Jan	83 (44.4%)
10-Jun	37 (19.8%)
15-Nov	16 (8.6%)
More than 15 years	6 (3.2%)

Table 2 Characteristic of patient pruritus and it affect in sleep

Variable	Frequency
Duration of pruritus	
No pruritus	124 (66.3%)
Had pruritus for less than six hours a day	53 (28.3%)
Pruritus all the day	10 (5.3%)
Distribution of pruritus with others	
With others	144 (77%)
In the palms	21 (11.2%)
To their soles	19 (10.2%)
Degree of pruritus	
Mild	24 (12.8%)
Moderate	8 (4.3%)
Severe	32 (17.1%)
Unbearable pruritus	1 (0.5%)
Pattern of pruritus	
Completely resolved	148 (79.1%)
Direction of the pruritus	
Better but still present	12 (6.4%)
Little bit better but still present	13 (7%)
Pruritus is getting worse	14(7.5%)
Sleep affection	
Never affects	151 (80.7%)
Affects	7 (3.7%)
Delay falling in sleep	13 (7%)
Delay falling asleep and occasionally wake them at night	7 (3.7%)
Delays falling in sleep and frequently wakes them at night	9 (4.8%)
Patient leisure/social	
No effect	123 (65.8%)
Never affects	44(23.5%)
Housework/errands	
Not affect	132 (70.6%)
Never affects	44 (23.5%)

Table 3 Risk factors/causes of ESRD

Risk factor/cause of esrd	Frequency\ percent
Hypertension	129(69%)
Diabetes miletus	37 (19.8%)
Glomerulonephritis	11 (5.9%)
Reno vascular disease	1 (0.5%)
Unknown	24 (12.8%)
Proteinuria	4 (2.1%)
Obstructive uropathy	22 (11.8%)
Poly cystic kidney disease	4 (2.1%)
CVS disease	18 (9.6%)
Congenital kidney disease	0 (0.0%)
Chronic liver disease	0 (0.0%)
HBV	4 (2.1%)
HCV	0 (0.0%)
HIV	0 (0.0%)
Others	18 (9.6%)
Total	187 (100%)

Risk factors of ESRD among the patients reported (69%) with hypertension, (19.8%) diabetes mellitus, (11.9%) obstructive uropathy and (12.8%) patients had unknown causes, the rest of risk factors were variable, as shown in Table 3.

Table 4 Distribution of pruritus

Distribution of pruritus	Frequency\percent
Head/scalp	1 (0.5%)
Face	2 (1.1%)
Chest	2 (1.1%)
Abdomen	6 (3.2%)
Back	25 (13.4%)
Buttocks	10 (5.3%)
Thighs	8 (4.3%)
Lower Limbs	2 (1.1%)
Top of feet and toes	0 (0.0%)
Soles	19 (10.2%)
Palms	21 (11.2%)
Top of hands/fingers	2 (1.1%)
Forearm	3 (1.6%)
Upper arm	2 (1.1%)
Point of contact with clothes	0(0.0%)
Groins	7 (3.7%)
Others	144 (77%)
Total	187 (100%)

Table 5 Correlation between the degree of Pruritus and specific variables

Degree of pruritus with	P.Value
Hypertension	
BMI	<0.05
Age	
Gender	

Statistical analysis

Statistically significant association was not found between the duration of hemodialysis and risk factors/causes of ESRD, duration of pruritus, degree of pruritus, direction of pruritus, impact of pruritus on sleep, leisure/social, housework/errands, and distribution of pruritus. Gender was the only variable that showed a statistically significant with the duration of hemodialysis, degree of pruritus, and proteinuria all by ($p < 0.05$). However, gender showed no significant association other variables.

Age showed statistically significant association with the degree of pruritus, hypertension, diabetes, unknown causes, and glomerulonephritis all by ($p < 0.05$). Body mass index and impact of pruritus on sleep showed statistically significant association with hypertension, diabetes, and glomerulonephritis all by ($p < 0.05$).

Discussion

This study assessed the frequency, severity, and impact of CKD-associated pruritus among ESRD patients undergoing HD at Kassala Teaching Hospital in Sudan. The findings demonstrate that CKD-aP remains a significant issue, affecting patient quality of life and often correlating with other clinical and demographic factors. The experience pruritus showed in table 2 aligns closely with existing studies (11), which suggest that pruritus affects 20–80% of CKD patients undergoing HD globally, with moderate to severe pruritus affecting 20–40% of patients. The age distribution showed that patients aged 36–55 had the highest frequency of CKD-aP, consistent with prior findings that middle-aged patients may exhibit higher pruritus incidence, likely due to prolonged dialysis duration and a higher prevalence of comorbidities. CKD-aP significantly impacted patients' quality of life, particularly affecting sleep, leisure activities,

and work or school tasks, even though 79.1% of patients reported resolution of pruritus symptoms. Approximately 20% of patients reported frequent or occasional sleep disturbances, a finding that is consistent with other studies highlighting the impact of CKD-aP on sleep, mental health, and general well-being. Studies by Rehman et al. (2018) and Sukul et al. (2021) report similar associations, where pruritus severity correlates with higher sleep disturbance scores and reduced health-related quality of life (HRQoL).^{12,13}

A notable proportion (65.8%) indicated no impact on leisure or social activities, potentially due to cultural or social support factors unique to the study setting.

Our study identified a significant correlation between hypertension and CKD-aP, which was the most common risk factor for ESRD at 69%. The results were parallel with other studies indicating that cardiovascular conditions, including hypertension, exacerbate pruritus due to disrupted blood flow and vascular integrity in the skin.¹⁰

Additionally, a significant correlation was observed between body mass index (BMI) and pruritus impact on sleep and associations between BMI and hypertension, diabetes, and glomerulonephritis. These results support existing evidence that higher BMI and metabolic disorders may exacerbate pruritus in HD patients.¹²

Conclusion

CKD-aP remains a prevalent and distressing condition among ESRD patients on HD, affecting various aspects of life, including sleep and daily activities. Identifying and managing factors associated with CKD-aP, such as hypertension and BMI, could alleviate symptoms and enhance the quality of life for these patients. Furthermore, longitudinal studies are needed to explore the long-term impact of CKD-aP on HRQoL and to evaluate the effectiveness of integrated management strategies in ESRD care.

Limitations and recommendations

This study is limited by its cross-sectional design, which restricts the ability to determine causality between CKD-aP and related comorbidities. Additionally, since pruritus is a subjective symptom, self-reported responses could have been influenced by recall or reporting biases. Despite these limitations, the findings emphasize the need for targeted interventions, including the potential use of topical treatments, gabapentinoids, and lifestyle interventions to manage pruritus severity. Routine pruritus screening and a multidisciplinary approach could significantly improve patient outcomes and quality of life.

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Conflict of interests

The authors declare that there are no conflicts of interest.

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