

## Prevalence of Cutaneous Manifestations in Chronic Kidney Disease (CKD) Patients Presenting to Nephrology Division at Khyber Teaching Hospital, Peshawar

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### ABSTRACT:

**Background:** Chronic Kidney Disease (CKD) is a prevalent health condition characterized by progressive loss of kidney function, leading to various systemic complications. Dermatological manifestations are common in CKD patients, impacting their quality of life and clinical management. Understanding the prevalence and types of cutaneous manifestations in CKD is essential for comprehensive patient care.

**Aim:** This study aimed to investigate the prevalence of cutaneous manifestations among CKD patients presenting to the Nephrology Division at Khyber Teaching Hospital, Peshawar, during the period from January 2023 to August 2023. The study sought to categorize the types and frequencies of these dermatological conditions and provide insights into their clinical significance.

**Methods:** A cross-sectional analysis was conducted, involving a review of medical records and dermatological assessments of CKD patients at Khyber Teaching Hospital. Inclusion criteria encompassed CKD patients with complete medical records within the specified timeframe, while exclusion criteria included patients with incomplete records or dermatological conditions unrelated to CKD. Data collection methods included systematic review and documentation of cutaneous manifestations such as pruritus, xerosis, pigmentary changes, nail abnormalities, and eczematous eruptions.

**Results:** Our study at Khyber Teaching Hospital revealed significant insights into the prevalence and types of cutaneous manifestations among Chronic Kidney Disease (CKD) patients. Pruritus emerged as the most prevalent cutaneous manifestation, affecting 70% of the total sample, followed by xerosis at 60% and pigmentary changes at

45%. Nail abnormalities were observed in 27.5% of patients, while eczematous eruptions were present in 17.5%. These findings provide a comprehensive understanding of the dermatological burden faced by CKD patients in our study population.

**Conclusion:** The high prevalence of cutaneous manifestations, particularly pruritus, xerosis, and pigmentary changes, underscores the importance of dermatological assessments in CKD patients. These dermatological conditions significantly impact patients' quality of life and require tailored management strategies. Our study contributes valuable insights to nephrology and dermatology practice, emphasizing the need for comprehensive patient assessments and personalized care plans to address CKD-related cutaneous manifestations effectively. Further research and interventions aimed at improving dermatological outcomes in CKD patients are warranted to enhance overall patient care and well-being.

**Keywords:** Chronic Kidney Disease, Cutaneous Manifestations, Dermatological Conditions, Pruritus, Xerosis, Pigmentary Changes, Nail Abnormalities, Eczematous Eruptions, Nephrology, Patient Care.

## Introduction

Chronic Kidney Disease (CKD) is a progressive condition characterized by the gradual loss of renal function over time, affecting millions of individuals worldwide and posing significant challenges in healthcare management (1). Among the myriad complications associated with CKD, dermatological manifestations have garnered increasing attention due to their prevalence and impact on patients' quality of life (2). Cutaneous manifestations in CKD patients encompass a wide spectrum of conditions, including but not limited to pruritus, xerosis, pigmentary changes, nail abnormalities, and eczematous eruptions (3, 4).

Studies have highlighted the multifactorial etiology of cutaneous manifestations in CKD, involving uremic toxins, metabolic disturbances, inflammation, and neurogenic factors (5, 6). The presence of dermatological symptoms often correlates with disease severity and can serve as clinical indicators of underlying renal pathology (7). Despite their clinical significance, dermatological assessments in CKD patients are sometimes overlooked, leading to underdiagnosed and inadequate management of these conditions (8).

Given the clinical relevance and underexplored aspects of cutaneous manifestations in CKD, this study aims to investigate the prevalence and types of dermatological conditions observed among CKD patients presenting to the Nephrology Division at Khyber Teaching Hospital in Peshawar, from January 2023 to August 2023. The study's objectives include categorizing the frequency of cutaneous manifestations, identifying common dermatological presentations, and enhancing our understanding of the dermatological burden in CKD populations.

To contextualize the significance of this study, it is imperative to review existing literature on CKD-related cutaneous manifestations. Previous research has elucidated the pathophysiological mechanisms underlying dermatological changes in CKD, highlighting the interplay between renal dysfunction, immune dysregulation, and skin barrier integrity (9, 10). Moreover, studies have underscored the impact of pruritus, one of the most prevalent cutaneous symptoms in CKD, on patients' physical and psychological well-being, emphasizing the need for effective management strategies (11, 12).

This study's findings are expected to contribute valuable insights to nephrology and dermatology practice, guiding clinicians in comprehensive patient assessments and tailored management approaches for CKD-related cutaneous

manifestations. By addressing gaps in knowledge regarding the prevalence and types of dermatological conditions in CKD, this research aims to improve patient outcomes and enhance the holistic care of CKD patients.

### **Methodology**

The present study was conducted at Khyber Teaching Hospital in Peshawar, spanning from January 2023 to August 2023, with the aim of investigating the prevalence of cutaneous manifestations among Chronic Kidney Disease (CKD) patients. This study employed a cross-sectional design to assess the types, frequencies, and clinical significance of dermatological conditions in CKD patients presenting to the Nephrology Division.

**Study Design:** A cross-sectional study design was employed to investigate the prevalence of cutaneous manifestations in CKD patients. This design allowed for a comprehensive assessment of dermatological conditions within the specified timeframe, providing valuable insights into the burden of skin-related issues in CKD.

### **Sample Size:**

The sample size for this study was determined based on power analysis and considerations of statistical significance. A total of 200 CKD patients visiting the Nephrology Division at Khyber Teaching Hospital during the study period were included in the analysis. These patients were selected based on their complete medical records and fulfillment of inclusion criteria related to CKD diagnosis.

### **Inclusion Criteria:**

- CKD patients visiting the Nephrology Division at Khyber Teaching Hospital from January 2023 to August 2023.
- Patients with complete medical records documenting CKD diagnosis and related clinical information.
- Adults aged 18 years and above.

### **Exclusion Criteria:**

- Patients with incomplete medical records or inadequate documentation of CKD diagnosis.
- Patients with dermatological conditions unrelated to CKD.
- Pediatric patients under the age of 18 years.

### **Data Collection:**

Data collection methods involved a systematic review of medical records and dermatological assessments conducted by trained healthcare professionals. Information regarding the types and frequencies of cutaneous manifestations such as pruritus, xerosis, pigmentary changes, nail abnormalities, and eczematous eruptions was documented.

### **Statistical Analysis:**

Statistical analysis was performed using appropriate methods to analyze the prevalence rates of cutaneous manifestations among CKD patients. Descriptive statistics such as frequencies, percentages, means, and standard

deviations were used to summarize the data. Comparative analysis between different types of cutaneous manifestations was conducted to identify significant trends and associations.

### Ethical Considerations:

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Informed consent was obtained from all participants or legally authorized representatives. Patient confidentiality was maintained throughout the study, and participants were assured of their right to withdraw from the study at any time without prejudice.

### Results

Table 1: Demographic Characteristics of CKD Patients

This table presents the demographic characteristics of Chronic Kidney Disease (CKD) patients in the study population. The mean age of the total sample was 58.4 years, with a standard deviation of 9.6 years. Females accounted for 40% of the total sample, while males accounted for 60%. Stage 2 CKD was the most prevalent stage, comprising 27.5% of the total sample. Hypertension was the most common comorbidity, present in 67.5% of patients.

Variable	Total Sample (n=200)	Intervention Group (n=100)	Control Group (n=100)
Age (years)	Mean ± SD	58.4 ± 9.6	57.9 ± 9.2
Gender (M/F)	Count (%)	120 (60%)	80 (40%)
CKD Stage	Count (%)		
- Stage 1	35 (17.5%)	15 (15%)	20 (20%)
- Stage 2	55 (27.5%)	30 (30%)	25 (25%)
- Stage 3	55 (27.5%)	25 (25%)	30 (30%)
- Stage 4	35 (17.5%)	20 (20%)	15 (15%)
- Stage 5	20 (10%)	10 (10%)	10 (10%)
Comorbidities	Count (%)		
- Hypertension	135 (67.5%)	70 (70%)	65 (65%)
- Diabetes	75 (37.5%)	40 (40%)	35 (35%)
- Cardiovascular	45 (22.5%)	25 (25%)	20 (20%)
- Others	25 (12.5%)	15 (15%)	10 (10%)

Table 2: Prevalence of Cutaneous Manifestations in CKD Patients

This table presents the prevalence of different cutaneous manifestations among Chronic Kidney Disease (CKD) patients in the study population. Pruritus was the most prevalent cutaneous manifestation, affecting 70% of the total sample. Xerosis and Pigmentary Changes were also frequently observed, with prevalences of 60% and 45%,

respectively. The least common cutaneous manifestations were Papules and Plaques, each observed in 1.5% and 1% of the total sample, respectively.

Cutaneous Manifestations	Total Sample (n=200)	Intervention Group (n=100)	Control Group (n=100)
Pruritus	140 (70%)	80 (80%)	60 (60%)
Xerosis	120 (60%)	65 (65%)	55 (55%)
Pigmentary Changes	90 (45%)	50 (50%)	40 (40%)
Nail Abnormalities	55 (27.5%)	30 (30%)	25 (25%)
Ecematous Eruptions	35 (17.5%)	20 (20%)	15 (15%)
Dermatitis	25 (12.5%)	15 (15%)	10 (10%)
Rash	18 (9%)	10 (10%)	8 (8%)
Ulcers	8 (4%)	5 (5%)	3 (3%)
Vesicular Lesions	5 (2.5%)	3 (3%)	2 (2%)
Papules	3 (1.5%)	2 (2%)	1 (1%)
Plaques	2 (1%)	1 (1%)	1 (1%)

## Discussion

The prevalence of cutaneous manifestations in Chronic Kidney Disease (CKD) patients is a topic of substantial interest due to its impact on patient quality of life and clinical management. Our study at Khyber Teaching Hospital revealed notable findings regarding the types and frequencies of these dermatological conditions among CKD patients. The discussion below elaborates on these findings and compares them with existing literature, particularly studies conducted in Europe, the UK, and the USA.

Previous research conducted in Europe, such as the study by Picardi et al. (2019) [13] in Italy, reported a high prevalence of pruritus among CKD patients, which aligns with our findings where pruritus was the most prevalent cutaneous manifestation. Furthermore, studies in the UK by Johnson et al. (2020) [14] and Smithson et al. (2018) [15] highlighted the impact of xerosis and pigmentary changes on CKD patients, consistent with our observations.

In the USA, research by Patel et al. (2021) [16] emphasized the significance of nail abnormalities as indicators of systemic pathology in CKD. Our study corroborates these findings, showcasing nail abnormalities as a notable cutaneous manifestation among CKD patients at Khyber Teaching Hospital.

The discussion extends to the clinical implications of these cutaneous manifestations. Pruritus, in particular, has been associated with decreased quality of life and psychological distress among CKD patients, as demonstrated in studies by Wang et al. (2017) [17] and Song et al. (2019) [18] in the USA. Similarly, pigmentary changes and xerosis can contribute to skin barrier dysfunction and discomfort, as discussed by Garcia et al. (2016) [19] in Spain. Addressing these dermatological concerns in CKD patients requires a multifaceted approach, including pharmacological interventions, topical therapies, and lifestyle modifications. Studies by Liu et al. (2020) [20] in Germany and Jones et al. (2019) [21] in the UK have explored the efficacy of various treatment modalities for managing cutaneous manifestations in CKD, emphasizing the need for personalized care plans tailored to individual

patient needs. Furthermore, research by Smith et al. (2017) [22] in the USA highlighted the importance of early dermatological assessment in CKD patients to prevent disease progression and improve outcomes. Additionally, a study by Brown et al. (2018) [23] in Canada emphasized the role of patient education and self-management strategies in addressing cutaneous manifestations in CKD.

### Conclusion:

Our study highlights the significant prevalence of cutaneous manifestations, including pruritus, xerosis, and pigmentary changes, among CKD patients at Khyber Teaching Hospital. Integrating dermatological assessments into CKD care is crucial for addressing these challenges effectively. Collaborative efforts between nephrologists and dermatologists are essential for developing personalized management plans. Future research should focus on evaluating targeted interventions and enhancing patient education for improved dermatological outcomes in CKD.

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