Original Article

Mucocutaneous Manifestations in Patients with Chronic Kidney Disease: A Cross-sectional Study

Rattan S. Rashpa, Vikram K. Mahajan, Pankaj Kumar[1], Karaninder S. Mehta, Pushpinder S. Chauhan, Ritu Rawat, Vikas Sharma

Departments of Dermatology, Venereology and Leprosy and [1]Internal Medicine, Dr. R. P. Govt. Medical College, Kangra, Himachal Pradesh, India

Abstract

Background: Chronic kidney disease (CKD)-associated mucocutaneous manifestations significantly impair the quality of life but often remain understudied. They may also vary across regions, socioeconomic and nutritional status, and racial differences. **Objectives:** To study the patterns of mucocutaneous disorders and their prevalence in CKD patients irrespective of clinical stage or dialysis status. **Materials and Methods:** 122 (M:F = 77:45) patients aged 21–85 (Mean ± SD = 57.5 ± 14.0) years having CKD for 3 month to 5 years were studied for mucocutaneous manifestations. Fifty (41%) patients were on hemodialysis for 1–42 months. Detailed medical history, clinical and mucocutaneous examination, and lab investigations were performed. KOH mounts, skin biopsy, Gram's and Giemsa staining, bacterial or fungal cultures were performed as required. **Results:** Xerosis in 93 (76.2%), skin pallor in 61 (50%), pruritus in 57 (46.7%), pigmentation in 47 (38.5%), and purpura in 18 (14.8%) patients were the major dermatoses. Bullous lesions and perforating folliculitis occurred in 3 (2.5%) patients each. Major nail abnormalities were pallor (in 35.2%), absent lunula (in 23.8%), nail discoloration (in 18%), and "half-and-half nails" in 16.4% patients, respectively. Hair abnormalities included sparse scalp and body hairs (in 35.2% and 13.1%, respectively) and lusterless hair in 12.3% patients. Coated tongue (in 14.8%), xerostomia (in 12.3%), and macroglossia with teeth indention (in 7.4%) patients were the mucosal manifestations. **Conclusions:** Xerosis, pruritus, skin pallor/pigmentary changes, nail pallor, absent lunula, nail discoloration, sparse hairs, coated tongue, xerostomia, macroglossia, and infections were the most common mucocutaneous manifestations in the studied patients irrespective of hemodialysis status. Cold and dry climates might be additional aggravators for xerosis/pruritus. Lifelong follow-up may be needed to reduce the morbidity associated with CKD/hemodialysis specific dermatoses appearing over a period.

Keywords: *Cutaneous manifestations, end-stage renal disease, skin diseases*

Introduction

Chronic kidney disease (CKD) is an irreversible deterioration in renal function classically developing over years and is defined as kidney damage or glomerular filtration rate <60 ml/min/1.73 m² for 3 months or more irrespective of the cause.[1] Most patients with severe CKD progress to end-stage renal disease (ESRD) with significant morbidity and mortality. It is a worldwide problem and accounts for approximately 850,000 deaths every year and 15 million disability adjusted lives; ESRD is the 12th cause of death and 17th cause of disability globally.[2] Cutaneous manifestations are common in all stages of CKD particularly towards ESRD with a prevalence of 50–100%.[3,4] With the advent of hemodialysis as a therapeutic modality for ESRD, some skin manifestations such as uremic frost and erythema papulatum uremicum have become rare, however, many other abnormalities of skin and appendages have emerged. Skin manifestations specific to dialysis patients include acquired perforating dermatosis, calcific uremic arteriolopathy (calciphylaxis), bullous lesions, and nephrogenic fibrosing dermopathy. On the other hand, pruritus, xerosis, nail disorders, hair disorders, pigmentary changes, purpura, mucosal changes, pallor, and uremic frost, though not specific to hemodialysis, are more frequent. However, it may be difficult to implicate either CKD or hemodialysis alone for any particular cutaneous manifestation as many of them are associated with both.[5] These manifestations may also vary across regions, with individual dietary habits, socioeconomic and nutritional status, and

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Address for correspondence:
Dr. Vikram K. Mahajan, Department of Dermatology, Venereology and Leprosy, Dr. R. P. Govt. Medical College, Kangra - 176 001, Himachal Pradesh, India.
E-mail: vkm1@rediffmail.com

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racial differences.[6] Because there are no data on the pattern of mucocutaneous manifestations in CKD patients from this part of the country, this study was carried out.

Patients and Methods

This study included 122 consecutive CKD patients aged ≥18 years recruited from the renal unit under internal medicine during April 2015 to March 2016. The study was approved by the Institutional Scientific Protocol Review Committee and Institutional Ethics Committee. All enrolled patients participated after providing informed written consent. Human immunodeficiency (HIV)-affected persons, renal transplant recipients, and patients with acute renal failure, hepatobiliary, pancreatic, or thyroid disorders, cutaneous, or systemic malignancies were excluded. Details of medical history, clinical and mucocutaneous findings, and investigations were recorded. KOH mounts, skin biopsy, Gram's and Giemsa staining, and bacterial or fungal cultures were performed when needed. The diagnosis and clinical staging of CKD was as per the National Kidney Foundation severity assessment criteria, and the severity of pruritus and xerosis was graded as mild, moderate, and severe [Table 1].[1,7,8] The data was analyzed using Pearson's Chi Square and Fischer's exact tests for categorical variables, and the Mann–Whitney nonparametric test was used for other variables that were not distributed normally. $P < 0.05$, calculated at the 5% level (95% confidence limit) was considered statistically significant.

Table 1: Staging of chronic kidney disease and severity grading of pruritus and xerosis

Staging of CKD[1,7]	Definition
Stage 1	normal estimated glomerular filtration rate (eGFR)* ≥90 mL/min per 1.73 m^2 and persistent albuminuria
Stage 2	eGFR between 60 and 89 mL/min per 1.73 m^2
Stage 3	eGFR between 30 and 59 mL/min per 1.73 m^2
Stage 4	eGFR between 15 and 29 mL/min per 1.73 m^2
Stage 5	eGFR <15 mL/min per 1.73 m^2 or end-stage renal disease
Severity of pruritus[8]	
Mild	Pruritus is episodic and localized without disturbance in routine work and sleep
Moderate	Pruritus is generalized and continuous without sleep disturbance
Severe	Pruritus is generalized and continuous disturbing sleep
Severity of xerosis[8]	
Absent (grade-0)	No Xerosis
Mild (grade-1)	Xerosis localized over legs only
Moderate (grade-2)	Xerosis localized over all the extremities
Severe (grade-3)	Xerosis generalized and ichthyosis-like

CKD, Chronic kidney disease; *eGFR, estimated calculated creatinine clearance (eCcr) is used as a correlate of GFR and calculated as: eCcr = (140–age) × (weight in kilograms) × (0.85 if female)/72 × Serum Creatinine in mg/dl

Results

Table 2 depicts the baseline characteristics of patients comprising 77 men and 45 women (M:F = 1.7:1) aged between 21 and 85 (mean ± SD = 57.5 ± 14.0) years having CKD for 3 months to 5 years. Fifty (41%) patients were on hemodialysis for 1–42 (mean ± SD = 9.3 ± 9.0) months. The blood urea levels ranged from 100 to 280 mg/dl in 92 (75.4%) patients. Hemoglobin was between 4.5 and 12 g/dl in 120 (98.4%) patients. One or more mucocutaneous disorders occurred in 120 (98.3%) patients [Tables 3 and 4].

Xerosis in 93 (76.2%) patients, severe and ichthyotic in 10 (8.2%) patients, and pruritus of mild to severe intensity in 57 (46.7%) patients were the most common manifestations. The pruritus intensity was mild to moderate in 52 (55.9%) patients with xerosis. Photodistributed hyperpigmentation in 47 (38.5%), skin pallor in 61 (50%), yellow-tinged skin in 7 (5.7%), and purpura/ecchymosis in 18 (14.8%) patients were present. Tense bullae over toes [Figure 1] and perforating folliculitis [Figure 2] were noted in 3 (2.5%) patients each who were also diabetic. Four (3.3%) patients aged 36–43 years had facial wrinkling. One patient, a diabetic and on hemodialysis for 3 months, had a nonhealing ulcer on the right foot. Mucosal abnormalities occurred in 48 (39.3%) patients and in the order of frequency were coated tongue in 18 (14.8%), xerostomia in 15 (12.3%), macroglossia with teeth markings [Figure 3], and fissured tongue in 9 (7.4%) patients each, angular cheilitis in 5 (4.1%), and aphthous stomatitis and black pigmented tongue [Figure 4] in 2 (1.6%) patients each. Hair abnormalities in 55 (45.1%) patients included sparse scalp and body hairs and lusterless hairs in 45 (35.2%), 16 (13.1%), and 15 (12.3%) patients, respectively. Nail changes in 91 (74.6%) patients comprised nail pallor in 43 (35.2%), absent lunula in 29 (23.8%), nail

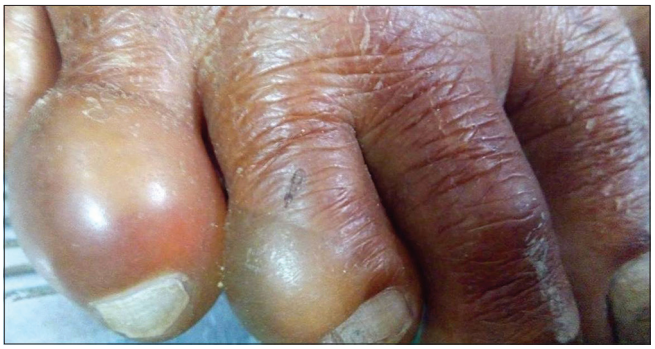

Figure 1: Large tense bullae over toes in a patient with diabetic nephropathy

Table 2: Baseline characteristics of patients with chronic renal disease

Baseline characteristics	Number of patients *n*=122 (%)	Patients on hemodialysis *n*=50 (%)	Patients without hemodialysis *n*=72 (%)	*P*
Gender				
Men	77 (63.1)	35 (70)	42 (58.3)	-
Women	45 (36.9)	15 (30)	30 (41.7)	-
Men: Women	1.7:1	2.3:1	1.4:1	-
Age				
21-30	3 (2.5)	3 (6)	0	-
31-40	10 (8.2)	6 (12)	4 (5.5)	-
41-50	21 (17.2)	12 (24)	9 (12.5)	-
51-60	39 (32)	17 (34)	22 (30.6)	-
61-70	28 (22.9)	9 (18)	19 (26.4)	-
>70	21 (17.2)	3 (6)	18 (25)	-
Mean±SD (Range) years	57.5±14.0 (21-85)	51.8±13.3 (21-80)	61.5±12.3 (35-85)	<0.0001
Duration				
<6 months to <2 years	99 (81.1)	38 (76)	61 (84.7)	-
2 years to 5 years	12 (9.8)	10 (20)	2 (2.8)	-
Unrecorded	11 (9.0)	2 (4)	9 (12.5)	-
Mean±SD (Range) month	9.3±9.0 (3-48)	15.6±10.6 (4-48) m	9.6±5.1 (3-24) m	<0.0001
CKD stage				
Stage III	6 (4.9)	0	6 (8.3)	-
Stage IV	31 (25.4)	0	31 (43.1)	-
Stage V (ESRD)	85 (69.7)	50 (100)	35 (48.6)	-
Blood urea Normal 13-45 mg/dl				
<100 mg/dl	30 (25.6)	3 (6)	27 (37.5)	-
100-150 mg/dl	56 (45.9)	27 (54)	29 (40.3)	-
151-200 mg/dl	26 (21.3)	17 (34)	9 (12.5)	-
>200 mg/dl	10 (8.2)	3 (6)	7 (9.7)	-
Mean±SD Range) mg/dl	131.9±47.0 (45-280)	144.7±32.7 (80-223)	123.0±53.0 (45-280)	0.0113
Hemoglobin Normal 13-17 g/dl				
>12 g/dl	2 (1.6)	0	2 (2.8)	-
5-12 g/dl	120 (98.4)	50 (100)	70 (97.2)	-
Mean±SD (Range) g/dl	8.3±1.3 (4.5-12.5)	8.0±1.0 (5.8-10.5)	8.6±1.5 (4.5-12.5)	0.0149
Etiology of CKD				
Diabetic nephropathy	69 (56.6)	21 (42)	48 (66.7)	-
Hypertensive nephropathy	39 (32)	23 (46)	16 (22.2)	-
Obstructive nephropathy	3 (2.5)	2 (4)	1 (1.4)	-
Multiple myeloma nephropathy	1 (0.8)	0	1 (1.4)	-
IgA nephropathy	1 (0.8)	1 (2)	0	-
Adult polycystic kidney	1 (0.8)	1 (2)	0	-
Analgesic nephropathy	1 (0.8)	1 (2)	0	-
Unidentified	7 (5.7)	1 (2)	6 (8.3)	-
Duration of hemodialysis				
<6 months	-	26 (52)	-	-
6 months to <2 years	-	19 (38)	-	-
2 years to <5 years	-	5 (10)	-	-
Mean±SD (Range) month	-	9.3±9.0 (1-42)	-	-

CKD: Chronic kidney disease, A $P<0.05$ was considered statistically significant

discoloration in 22 (18%), and Lindsay's "half-and-half nails" [Figure 5] in 20 (16.4%) patients. Other nail changes included longitudinal ridging in 13 (10.7%), subungual hyperkeratosis in 11 (9%), onycholysis in 10 (8.2%), dystrophic nails in 7 (5.7%), Beau's lines in 6 (4.9%), and koilonychia in 5 (4.1%) patients, respectively. Statistically, patients on hemodialysis were older, had longer duration of CKD, skin and nail pallor, elevated blood urea levels, and low hemoglobin (mean ± SD = 7.2 ± 0.8 g/dl) than patients without hemodialysis, and the difference was statistically significant ($P < 0.05$). Table 5 lists various bacterial, fungal, and viral infections noted in 59 (48.4%) patients.

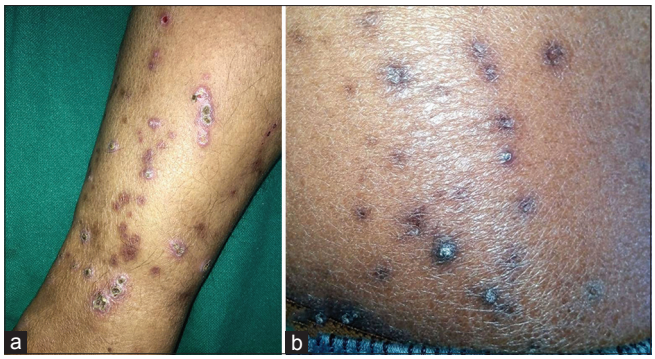

Figure 2: Perforating folliculitis with keratotic papules over (a) leg (b) abdomen. Note severe ichthyotic skin over trunk

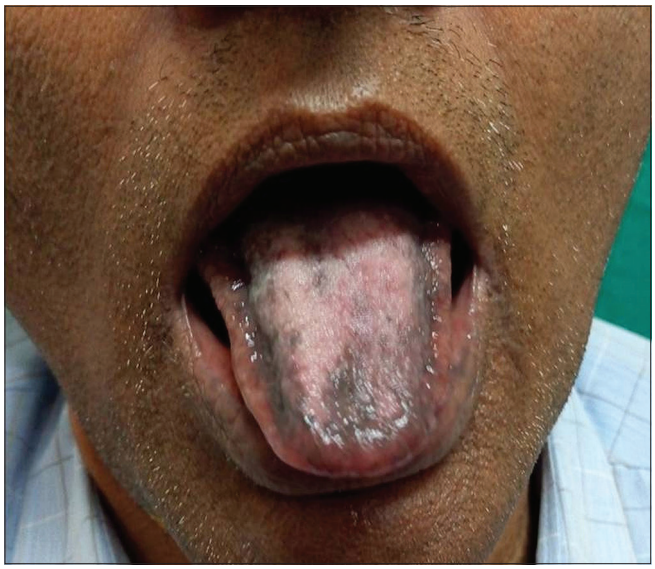

Figure 4: Black pigmentation of tongue

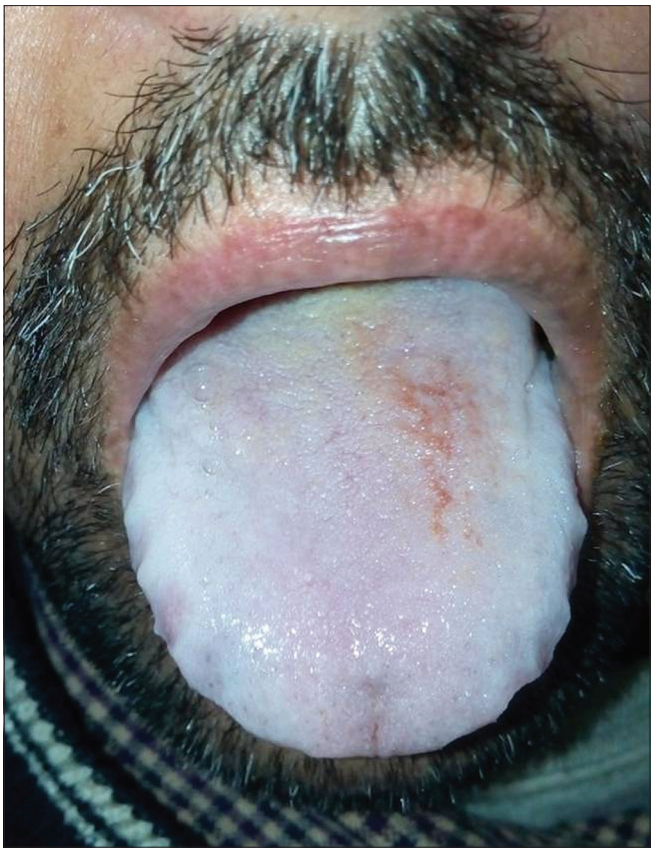

Figure 3: White coated tongue and Macroglossia with prominent teeth markings, the characteristic "tongue sign of uremia"

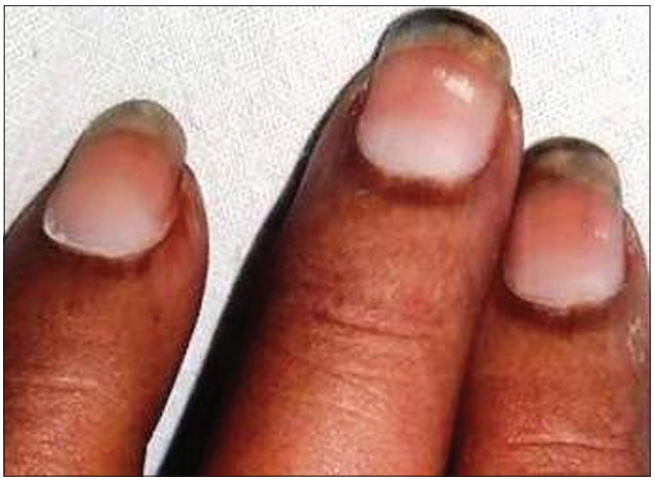

Figure 5: Lindsay's "half and half nails" - a characteristic colored band over distal nail plate and pale proximal nail plate

Discussion

Clinicodemographic profile of our patients is similar to previous reports.[6,9-15] Xerosis of variable severity is well known in 23–90% patients irrespective of dialysis status.[6,9,10,16] Skin dehydration, diuretics, hypervitaminosis A, reduced sebum/sweat excretion, altered skin barrier, and low emollient usage have been primarily implicated for severity of xerosis whereas marked irritancy to external factors (sun, dust, detergents) is aggravating.[5,9,17-19] However, prevailing dry and cold climate in this region was an additional aggravating factor in our patents. In addition to pruritus, associated with xerosisis is elastosis and premature skin wrinkling in 33–40% patients.[13,14,19] Only 4 (3.3%) patients showed early skin wrinkling in this study. Generalized or localized, episodic or continuous pruritus of variable intensity is frequent in CKD. It may or may not improve from hemodialysis and occurs in 15–49% during predialysis and in 19–90% hemodialysis patients.[4,9,8,11] The pruritus was mild to severe in our 57 (46.7%) patients. However, there was no significant difference among patients with or without hemodialysis. The pathogenesis of uremic pruritus is poorly understood but its intensity is directly proportional to the severity of xerosis.[19] The pruritus of mild to moderate intensity correlated to xerosis severity in our 52 (55.9%) patients. Sun-exposed skin hyperpigmentation observed in 47 (38.5%) CKD and 48% of the hemodialysis patients corroborated the reported prevalence of 22–54% patients correlating to the duration of dialysis as well.[9,16] It is mostly attributed to excessive melanin in basal layer

Table 3: Cutaneous and mucosal manifestations in patient with chronic renal disease

Skin changes	Total *n*=122 (100%)	CKD Stage III *n*=6 (4.9%)	CKD Stage IV *n*=31 (25.4%)	CKD Stage V *n*=85 (69.7%)	On Hemo-dialysis *n*=50 (41%)	In pre-dialysis *n*=72 (59%)	*P*
Cutaneous manifestations							
Xerosis	93 (76.2)	4 (66.7)	24 (77.4)	65 (76.5)	38 (76.0)	55 (76.4)	0.9595
Skin pallor	61 (50.0)	0 (0.0)	8 (25.8)	53 (62.4)	32 (64.0)	29 (40.3)	**0.0103**
Pruritus	57 (46.7)	3 (50.0)	12 (38.7)	42 (49.4)	26 (52.0)	31 (43.0)	0.3291
Diffuse hyperpigmentation	47 (38.5)	2 (33.3)	7 (22.6)	38 (44.7)	24 (48.0)	23 (31.9)	0.0735
Purpura/ecchymosis	18 (14.8)	0 (0.0)	5 (16.1)	13 (15.3)	9 (18.0)	9 (12.5)	0.4015
Ichthyosis	10 (8.2)	0 (0.0)	5 (16.1)	5 (5.9)	4 (8.0)	6 (8.3)	0.9528
Yellowish tinge	7 (5.7)	0 (0.0)	3 (9.7)	4 (4.7)	4 (8.0)	3 (4.2)	0.3775
Early wrinkling	4 (3.3)	1 (16.7)	1 (3.2)	2 (2.4)	2 (4.0)	2 (2.8)	0.7160
Bullous lesions	3 (2.5)	0 (0.0)	1 (3.2)	2 (2.4)	1 (2.0)	2 (2.8)	0.7805
Perforating folliculitis	3 (2.5)	0 (0.0)	0 (0.0)	3 (3.5)	2 (4.0)	1 (1.4)	0.3644
Foot ulcers	1 (0.8)	0 (0.0)	0 (0.0)	1 (1.2)	1 (2.0)	0 (0.0)	0.2301
Mucosal manifestations							
Coated tongue	18 (14.8)	1 (16.7)	6 (19.4)	11 (12.9)	8 (16.0)	10 (13.9)	0.7488
Xerostomia	15 (12.3)	2 (33.3)	0 (0.0)	13 (15.3)	7 (14.0)	8 (11.1)	0.6327
Macroglossia with teeth markings (tongue sign of uremia)	9 (7.4.0)	0 (0.0)	2 (6.5)	7 (8.2)	5 (10.0)	4 (5.6)	0.3633
Fissured tongue (lingua plicata)	9 (7.4)	1 (16.7)	3 (9.7)	5 (5.9)	2 (4.0)	7 (9.7)	0.2377
Angular cheilitis	5 (4.1)	0 (0.0)	0 (0.0)	5 (5.9)	3 (6.0)	2 (2.8)	0.3833
Aphthous stomatitis	2 (1.6)	0 (0.0)	0 (0.0)	2 (2.4)	0 (0)	2 (2.8)	0.2347
Pigmented tongue	2 (1.6)	1 (16.7)	1 (3.2)	0 (0.0)	0 (0)	2 (2.8)	0.2347

CKD: Chronic kidney disease, A $P<0.05$ was considered statistically significant. Bold Value: Significant

Table 4: Hair and nail disorders in chronic renal disease patients

Manifestations	Total *n*=122 (%)	CKD Stage III *n*=6 (4.9%)	CKD Stage IV *n*=31 (25.4%)	CKD Stage V *n*=85 (69.7%)	On Hemo-dialysis *n*=50 (41%)	In Pre- dialysis *n*=72 (59%)	*P*
Hair changes							
Sparse scalp hair	43 (35.2)	2 (33.3)	11 (35.5)	30 (35.3)	17 (34.0)	26 (36.1)	0.8120
Sparse body hair	16 (13.1)	0 (0.0)	4 (12.9)	12 (14.1)	6 (12.0)	10 (13.9)	0.7608
Lusterless hair	15 (12.3)	2 (33.3)	2 (6.5)	11 (12.9)	3 (6.0)	12 (16.7)	0.0781
Nail changes							
Nail pallor	43 (35.2)	0 (0.0)	8 (25.8)	35 (41.2)	24 (48.0)	19 (26.4)	**0.0145**
Absent lunula	29 (23.8)	1 (16.7)	6 (19.4)	22 (25.9)	12 (24.0)	17 (23.6)	0.9595
Half and half nails	20 (16.4)	0 (0.0)	3 (9.7)	17 (20.0)	12 (24.0)	8 (11.1)	0.0594
Nail discoloration	22 (18.0)	2 (33.3)	5 (16.1)	15 (17.6)	7 (14.0)	15 (20.8)	0.3384
Longitudinal Ridging	13 (10.7)	2 (33.3)	3 (9.7)	8 (9.4)	5 (10.0)	8 (11.1)	0.8470
Subungual hyperkeratosis	11 (9.0)	0 (0.0)	4 (12.9)	7 (8.2)	5 (10.0)	6 (8.3)	0.7479
Onycholysis	10 (8.2)	0(0.0)	1 (3.2)	9 (10.6)	3 (6)	7 (9.7)	0.4653
Dystrophic nails	7 (5.7)	2 (33.3)	2 (6.5)	3 (3.5)	1 (2.0)	6 (8.3)	0.1421
Beau's lines	6 (4.9)	0 (0.0)	3 (9.7)	3 (3.5)	3 (6.0)	3 (4.2)	0.6531
Koilonychia	5 (4.1)	0 (0.0)	0 (0.0)	5 (5.9)	3 (6.0)	2 (2.8)	0.3833

CKD: Chronic kidney disease, A $P<0.05$ was considered statistically significant. Bold Value: Significant

and superficial dermis from increased poorly dialyzable β-melanocyte-stimulating hormone.[3,4,9,13,16] Yellow-tinged skin in 40% CKD patients is attributed to retained lipid soluble pigments in dermis/subcutis.[4] However, it was noticed in our 7 (5.7%) patients only possibly due to poor appreciation of this subtle color against our dark-skin (type-V) patients. Anemia occurs in 34–94.3% CKD patients mainly from decreased renal erythropoietin, iron, folic acid, or vitamin B12 deficiency, poor erythrocyte survival, and blood loss during dialysis.[11,13,16] Skin pallor in 61 (50%) patients was apparently from anemia and was significantly more common among patients on hemodialysis ($P < 0.05$). Purpura, ecchymosis, and petechiae reportedly occurred in 9–20%, 27%, and 19% CKD patients on

Table 5: Cutaneous infections in patient with chronic renal disease

Skin infections	Total *n*=122 (100%)	CKD Stage III *n*=6 (4.9%)	CKD Stage IV *n*=31 (25.4%)	CKD Stage V *n*=85 (69.7%)	On Hemo-dialysis *n*=50 (41%)	In Pre-dialysis *n*=72 (59%)	*P*
Bacterial infections	15 (12.3)	0 (0.0)	7 (22.6)	8 (9.4)	3 (6.0)	12 (16.7)	0.0781
Folliculitis	8	0	3	5	2	6	
Furunculosis	3	0	2	1	0	3	
Ecthyma	2	0	2	0	0	2	
Carbuncle	2	0	0	2	1	1	
Viral infections	7 (5.7)	1 (16.7)	1 (3.2)	5 (5.9)	3 (6.0)	4 (5.6)	0.9260
Herpes simplex	5	1	0	4	3	2	
Herpes zoster	1	0	0	1	0	1	
Erythema multiforme	1	0	1	0	0	1	
Fungal infections	47 (38.5)	5 (83.3)	13 (41.9)	29 (34.1)	16 (32.0)	31 (43.0)	0.2213
Onychomycoses	28	3	8	17	9	19	
T. pedis	8	0	4	4	1	7	
T. cruris and *T. corporis*	4	0	0	4	3	1	
Intertrigo	3	0	1	2	1	2	
Oral candidiasis	2	1	0	1	1	1	
Pityriasis versicolor	2	1	0	1	1	1	

CKD: Chronic kidney disease, A $P<0.05$ was considered statistically significant

hemodialysis, respectively, but said to improve after hemodialysis.[11,14,16] Increased vascular fragility and platelet dysfunction from high blood urea levels or heparin use during dialysis have been implicated. Purpura and ecchymosis in our 18 (14.8%) patients with blood urea levels above 100 mg/dl corroborated but did not correlate with hemodialysis status. Bullae (dialysis-pseudoporphyria) possibly from transfusion-related iron overload usually affect 2–18% patients.[5,17] However, diabetic or uremic neuropathy causing blisters in 3 (2.5%) patients unrelated to hemodialysis status also remain a possibility. Perforating folliculitis of unclear pathophysiology is significantly common among diabetic CKD patients.[11] Similarly, these patients are at an increased risk of foot ulcer/amputation primarily from peripheral neuropathy.[20] The perforating folliculitis in 3 (2.5%) patients and nonhealing foot ulcer in a diabetic patient on hemodialysis for 3 months also corroborates these findings.[9,11,13,14]

Coated tongue in 18 (14.8%) and xerostomia in 15 (12.3%) patients were the most common mucosal abnormalities. Macroglossia with teeth markings in 9 (7.4%) patients usually affects 9–43% cases and is considered characteristic of uremia.[13,15] Although fissured tongue affects 4–8% CKD patients and also up to 20% of the general population, its pathogenesis and significance in CKD remains poorly elucidated.[6,12] Agreeably, nutritional deficiencies, candidiasis, poor oral hygiene, smoking, consumption of alcohol or hot/spicy foods, dehydration, and mouth breathing remain overall possible pathogenetic triggers.[13,14]

Nail pallor in 43 (35.2%) patients having anemia was the most common finding corroborating its reported prevalence of 67% CKD and 96% patients on hemodialysis.[10,21] Absent lunula observed in 29 (23.8%) patients reportedly occurs in 17–63% patients irrespective of dialysis status.[13] Other consistent nail change characteristic of CKD with or without dialysis is Lindsay's "half-and-half nails," a band of discoloration over the distal nail plate from increased density of nail bed capillaries, with a reported prevalence of 17–76%.[11,22] Comparatively, we noted "half and half nails" in 20 (16.4%) patients including among those on hemodialysis. Sparse scalp and body hairs in 45 (35.2%) and 16 (13.1%), and lusterless hairs in 15 (12.3%) patients, respectively, seen in our patients corroborates their reported prevalence of 30–70%.[10,16,22] Apparently, reduced sebum production and parathormone levels, anemia, stress of ESRD/dialysis, or neglecting hair care could be implicated.[11,13,14,22] The 28–70% CKD patients also have increased susceptibility for bacterial, fungal, and viral cutaneous infections due to reduced immunity.[4,13,23] In this study, 59 (48.4%) patients with or without hemodialysis also suffered these infections. More CKD/hemodialysis-specific dermatoses probably appear over a period.

Conclusion

Xerosis, pruritus, skin pallor/pigmentary changes, nail pallor, absent lunula, nail discoloration, sparse hairs, coated tongue, xerostomia and macroglossia, and infections were the most common mucocutaneous manifestations in majority of studied patients irrespective of their hemodialysis status. Cold and dry climates might be additional aggravators for xerosis/pruritus. Lifelong follow-up is needed to reduce the morbidity from dermatoses considered CKD/hemodialysis specific that may appear over time. Short duration and the cross-sectional nature of the study are some of the limitations of this study.

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Conflicts of interest

There are no conflicts of interest.

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