

## Dermatological Manifestation of Chronic Kidney Disease

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### ABSTRACT

**Introduction:** Dermatological abnormalities are common in chronic kidney disease (CKD) and it can vary from xerosis, pruritus to hyperpigmentation, purpuric skin changes, nail abnormalities.

**Methods:** This is a cross sectional observational study. The objective is to determine the prevalence of skin diseases in chronic kidney disease.

**Results:** Forty-nine patients (30 males and 19 females) were examined. In this study, the commonest presenting symptom was pruritus in 29(59.2%). Pruritus followed by pain in 15(30.6%) and burning sensation in 9(18.4%). Hyperpigmentation was the most common finding in our study. It was followed by xerosis in 17(34.7%), nail changes in 16(32.7%), eczema in 11(22.4%), steroid induced side-effects like acneiform eruptions in 6 patients (4%) and cushingoid facies in 2 patients. Similarly generalized pruritus were noted in 9 cases (18.4%), tinea in 9 patient (18.4%), herpes zoster and verruca in 7 (14.3%each)patients, herpes simplex in 6 patients (12.2%), bacterial infection in 5 and purpura in 5 patients (10.2%each), followed by urticaria in 4 patients (8.2%), SLE(8.2%), DLE in 2(4.1%), erythema nodosum in 4 (8.2%), pityriasis versicolor in 3(6.1%). Nail changes was seen in 16(32%) and included leuconychia in (40%), koilonychia (24%), subungual hyperkeratosis (20%), onycholysis (10%), mees' lines (4%) and beau's lines (2%).

**Conclusion:** In our study hyperpigmentation was the most common finding followed by xerosis and nail changes.

**Keywords:** Chronic kidney disease (CKD), Cutaneous, Prevalence, Purpura

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## INTRODUCTION

Dermatological abnormalities are common in Chronic Kidney Disease (CKD) and it can vary from xerosis, pruritus to hyperpigmentation, purpuric skin changes, nail abnormalities. In a study by Pico et al<sup>2</sup> all patients with CKD had one or more skin manifestations, while Bencini et al<sup>3</sup> noticed skin changes in 79% of the patients. This study was done to determine the prevalence of cutaneous abnormalities in Chronic Kidney Disease patients.

Skin is the most visible and easily accessible organ of the human body. For a clinician, it may function as an important diagnostic window to diseases affecting internal organs. Knowledge and accurate diagnosis of these cutaneous alterations is important. It will help in the proper management of these patients.

## METHODS

The study was carried out in the dermatology Out-patient Department, Nephrology out-patient Department and inpatients in the wards of KIST Medical college, Imadol, Lalitpur from January 2012 to January 2013. Patients with Kidney diseases, on medical treatment, on dialysis or renal transplant were included in this prospective, observational study. A history of duration of kidney disease, dialysis, as well as onset of skin disease, the medications the patient was on, any abnormal investigations was noted. A complete clinical and dermatological examination was carried out. Investigations were done as necessary and findings were entered in a proforma.

Specific investigations like skin biopsy, culture and sensitivity for bacterial infections, Gram's stain, potassium hydroxide mount and fungal culture were done for the confirmation of diagnosis in doubtful situation. Routine investigations for monitoring renal functions were recorded. Results were tabulated and analysed in SPSS.

## RESULTS

Forty-nine patients (30 males and 19 females) were examined. Most of them were aged between 50-69, the mean age being 43.06. Youngest patient was aged 17 years and the oldest, 82 years. The age group of 50-69 were the highest accounting to 46.9% followed by age group 25-49 (24.5%). The duration of chronic renal disease varied from 2 weeks to several years. All patients examined in the study showed at least one cutaneous disease. Out of the total 49 patients, 63.3% had at least one cutaneous manifestation, 18 patients (36.7%) suffered from more than 1 skin disease, and 15 of them (30.6%) showed 3 skin manifestations and one patient had 4 skin manifestations, although only (42%) complained of some skin problem. Out of the 49 patients (63.3%) were literate, 75.5% were employed. In this study, the commonest presenting symptom was pruritus in 29 (59.2%). Pruritus was followed by pain in 15 (30.6%) and burning sensation in 9 (18.4%). Most patients came to us in the early stage of skin

disease that is, less than 6 months (65.3%), followed by duration of 1-5 yrs as shown in Table II. In the kidney diseases 21 patients (42.9%) were on dialysis and 12 (24.5%) were renal transplant patients and the rest 16 (32.6%) suffered from other Chronic Kidney Diseases like diabetic nephropathy, chronic glomerulonephritis, hypertension, obstruction and connective tissue disorders like SLE. Most patients 28 (57.1%) had kidney disease from 6 months to 1 year then the second most common was less than 6 months (20.4%). Hyperpigmentation was the most common finding in our study. It was followed by xerosis in 17 (34.7%), nail changes in 16 (32.7%), eczema in 11 (22.4%), steroid induced side-effects like acneiform eruptions in 6 patients (4) and cushingoid facies in 2 patients.

Similarly generalized pruritus were noted in 9 cases (18.4%), tinea in 9 patients (18.4%), herpes zoster and verruca in 7 (14.3% each) patients, herpes simplex in 6 patients (12.2%), bacterial in 5 and purpura in 5 patients (10.2% each), followed by urticaria in 4 patients (8.2%), SLE (8.2%), DLE in 2, erythema nodosum in 4 (8.2%), pityriasis versicolor in 3 (6.1%) as shown in Table I. Other diseases like scabies 2 (4.1%), psoriasis 1 (2.1%), ichthyosis 1 (2.1%), alopecia areata 1 (2.1%), acrochordon 4 (8.2%), dermatosis papulosa nigra 3 (6.1%), prurigo nodularis 2 (4.1%) adverse drug reaction to amoxicillin in 1 (2.1%) patient.

Table 1: Percentage Distribution of different diseases.

	Total	%
Eczema	11	22.4%
Tinea	9	18.4%
Verruca	7	14.3%
Urticaria	4	8.2%
Scabies	2	4.1%
Purpura	5	10.2%
Bacterial Infection	5	10.2%
Herpes Zoster	7	14.3%
Pruritis	9	18.4%
Xerosis	17	34.7%
SLE	4	8.2%
DLE	2	4.1%
Nail Change	16	32.7%
Hyperpigmentation	28	57.1%
H. Simplex	6	12.2%
E. Nodosum	4	8.2%
P. Versicolor	3	6.1%
ADR	1	2.0%
Others	11	22.4%

SLE: Systemic lupus erythematosus, DLE: Discoid lupus erythematosus, ADR – Adverse drug reaction

In the associated diseases hypertension was most common disease in 25(51%), diabetes in 11 (24%) both diabetes and hypertension were found in 32(65.3%) and other diseases like glomerulonephritis and SLE were found in 10(20.4%) as shown in Table III. In our study we found 25 (51%) on long term steroid, cyclosporine 14(28.6%), antihypertensive in 13(26%), followed by tacrolimus in 8(16.3%) and allopurinol in 7(14.3%). We also found out of the 49 patients 25 had normal level of urea and 24 (49%) had deranged renal function test.

Table 2: Symptoms with duration of diseases

Symptoms	< 6 month	6 - 12 month	1 - 5 years	> 5 years	Total	%
Pruritis	9	15	2	2	28	57.14
Pain	1	9	0	5	15	30.61
Burning	1	5	1	1	8	16.33
Total	11	29	4	8	52	106.12

Pruritus, pain and burning were noticed in higher numbers within the 6-12 months of kidney disease manifestation. Even though 22.2% (6/27) of patients on steroid developed steroid related side effect compared to 4.5% (1/22) who were not on steroid, it was not statistically significant.

Table 3: Aetiology of CRF

Aetiology	Male	Female	Total	% (N=49)
HTN	15	9	24	49.0%
DM	9	2	11	22.4%
Both	20	12	32	65.3%
Other	7	4	11	22.4%



Figure 1: itchy nodular lesion on extensor aspect of forearm (Prurigo nodularis)



Figure 2: whitish discoloration of all the finger nails (leuconychia)

**DISCUSSION**

Pruritus is one of the most characteristic and annoying symptoms of CKD. In this study, the commonest presenting symptom was pruritus in 29(59.2%) of the patient, a finding similar to the study done by Udaykumar et al<sup>4</sup>, where they found a prevalence of 53%. In skin finding the most (57.1%) commonest symptoms was hyperpigmentation of the skin in 28 patients (57.1 %), which was consistent with the report of Deepshikha et al, that hyperpigmentation was predominantly on the sun-exposed parts which has been attributed to an increase in melanin in the basal layers of the epidermis due to increase in poorly dialyzable melanocyte stimulating hormone<sup>5</sup>. Xerosis was the second most common cutaneous abnormality (34.7%), as observed in previous reports (46-90%)<sup>6-8</sup>. Lindsay's nails (half and half nails) are red, pink or brown in their distal half (this color does not fade with pressure) and white in the proximal Half<sup>9</sup>. This change was seen in 16 (32.7%) of our patients and was significantly more prevalent in diabetic patients (p = 0.029). Previous studies have found a prevalence of 16-50(6%)<sup>2,7</sup>. Nail changes included leuconychia in (40%), koilonychia (24%), subungual hyperkeratosis (20%), onycholysis (10%), mees' lines (4%) and beau's lines (2%). It was consistent with the finding of a study done in Nepal by Amatya et al<sup>10</sup>. In the skin infections total patient was 21(42.8%), in which we found bacterial infection in 3 cases, viral infection in 14 (verruca in 4, herpes zoster in 6, herpes simplex in 4), fungal infection in 2 and parasitic in 2 patients. The commonest one was viral infection (66.6%). The percentage of cutaneous infection in an Indian study<sup>4</sup> and Egyptian study<sup>11</sup> were 55% and 40% respectively. Increase susceptibility to infection can either be due to inflammation caused by the use of nonsterile dialysate and nonbiocompatible membranes<sup>2</sup> during hemodialysis or CRF. Patients with CRF have impaired cellular immunity due to diminished T and B cell function and decrease natural killer cell activity<sup>12</sup>. This could explain the high prevalence of

infections in these patients. Purpura was seen in nine (9%) patients. Easy bruising was reported in a previous study. Defects in primary hemostasis like increased vascular fragility, abnormal platelet function and the use of heparin during dialysis are the main causes of abnormal bleeding in these patients<sup>13</sup>. Dermatological conditions like uraemic frost, erythema papulatum uraemicum, uraemic roseola now rarely occur in a patient with CKD. Certain specific disorder associated with CKD such as calciphylaxis and fibrosing dermopathy of uraemia were not seen in our study may be due to early dialysis.

### CONCLUSION

All our 49 patients on hemodialysis showed at least one cutaneous alteration. Patients with End Stage Renal Failure (ESRD) may present with an array of skin abnormalities. With the advent of hemodialysis, the life expectancy of these patients has increased, giving time for more and newer cutaneous changes to manifest. Some prophylactic and remedial measures can prevent or decrease some of the adverse changes. These include emollients for xerosis; sunscreens, sun avoidance measures and clothing for pigmentary changes and cutaneous malignancies; nutritional supplementation to prevent vascular fragility, angular cheilitis and hair loss; and prompt recognition and treatment of these diseases leads increase in the quality of life.

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