

**To study the cutaneous manifestations in patients with CKD in Hadoti Region of Rajasthan.**

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**Type of Publication:** Original Research Paper

**Conflicts of Interest:** Nil

**Abstract**

**Background-** The chronic kidney disease (CKD) is defined as the presence of kidney damage or decreased level of kidney function for three months or more, irrespective of etiology.

**Methods-** This study was undertaken to study the variety of cutaneous manifestations in chronic renal disease cases. 200 patients of CKD, were examined for skin changes.

**Results-** The mean age was  $44.7 \pm 15.46$  yrs (range 18-88). This study included 117 males (58.5%) and 83(41.5%) females with male to female ratio of 1.4:1. Most common etiology causing CKD was hypertension(93), to be followed by diabetes mellitus (42). Xerosis was the most common manifestation overall, seen in 75 males and 63 females. Pruritus was observed in 57 patients in our study. It was seen in 37 males and 20 (24.1%) females.

**Conclusion-** Early recognition of these skin manifestations and prompt initiation of treatment can dramatically alter their course and even detect underlying renal disease.

**Keywords** – renal disease, skin manifestations, hyperpigmentation

**Introduction**

The chronic kidney disease (CKD) is defined as the presence of kidney damage or decreased level of kidney function for three months or more, irrespective of etiology. The common causes of chronic kidney disease are many. The incidence and prevalence of chronic kidney disease is increasing in Indo-Asian than in Europe<sup>1</sup>.

The effects of chronic kidney disease are complex as it causes dysfunction of multiple organs<sup>2</sup>. Skin often acts as a diagnostic window in CKD by presenting myriad manifestations. With increasing prevalence of CKD and newer advances in medicine leading to its better management in the form of hemodialysis, peritoneal dialysis and renal transplantation and consequential better quality of life and life expectancy, the diversity of dermatological manifestations is also broadening. CKD presents in various forms in skin, nails, mucosa and hairs due to complex interplay of etiological factors, comorbidities, investigative and management modalities. These manifestations can be either non-specific or specific to CKD. Non -specific disorders include pigmentary disorders, pruritus, xerosis, acquired ichthyosis, and half- and- half nail. Specific disorders include acquired

perforating dermatosis, calciphylaxis, bullous dermatoses, and nephrogenic systemic fibrosis.

### Materials and Methods

It was a non-interventional point source observational study, conducted on patients attending the outpatient departments of Dermatology, Venereology and Leprology and Nephrology of Government Medical College and attached group of hospital, Kota, Rajasthan.

Sample Size was 200 consecutive patients of CKD

Study Period was one year (from June 2016 to May 2017)

Case Definition: Diagnosis and staging of CKD was based on clinical examination by an experienced nephrologist.

In case of doubt, the diagnosis was confirmed by relevant laboratory, radiological investigations and renal biopsy.

The definition of CKD was based on persistent decline in renal function lasting for at least three months. The various dermatological manifestations were observed by investigator and confirmed by two experienced dermatologists under adequate natural light. Various dermatological manifestations were recorded in a predesigned pro-forma and photographic documentation was done at the same sitting.

**Study Population:** All chronic kidney disease patients attending the dermatology and nephrology out-patient department of GMC, Kota and fulfilling inclusion criteria were in cases.

**Inclusion Criteria** were Patients of both sexes with CKD aged >18 years and Duration of chronic kidney disease >3 months

**Exclusion Criteria** were Age < 18 years, patients on peritoneal dialysis, post renal transplantation patients, patients of acute renal failure and patients of known immunosuppression

### Data collection –

Patients were examined by investigator of the study (junior resident department of dermatology, GMC, Kota)

for the diagnosis of dermatological manifestations. The diagnosis was confirmed by an experienced dermatologist and in doubtful cases, histopathological examination was performed.

Demographic profile of the patient including name, age, sex, residential address and disease characteristics like primary disease causing CKD, duration of CKD, stage of CKD, personal/family history of structural kidney defects and duration of hemodialysis with duration were included. Various non-infective and infective manifestations involving skin, nails, hairs, oral mucosa were documented separately.

### Data Analysis

To collect required information from eligible patients a pre-structured pre-tested Proforma will be used. For data analysis Microsoft excel and statistical software SPSS will be used and data will be analyzed with the help of frequencies, figures, proportions, measures of central tendency, appropriate statistical test

### Results

The mean age was  $44.7 \pm 15.46$  yrs (range 18-88). Maximum number of patients in the study belonged to age group of 51-60 years. This study included 117 males (58.5%) and 83(41.5%) females with male to female ratio of 1.4:1.

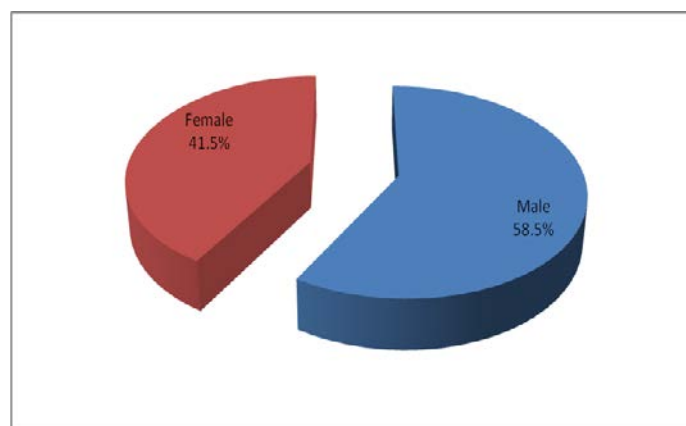


Fig.no.1.sex wise distribution of CKD patients.

Table 1- Distribution of the cases according to etiology

Primary Etiology	Number of patients	percentage
Hypertension	93	46.5
Diabetes mellitus	42	21
Obstructive uropathy	15	7.5
Chronic interstitial nephritis	2	1
Nephrotic Syndrome	4	2
Polycystic Kidney Disease	7	3.5
Analgesic abuse	3	1.5
Hepatorenal syndrome	1	0.5
Nephritic syndrome	1	0.5
Cardio renal syndrome	1	0.5
Renal tuberculosis	1	0.5
Lupus nephritis	1	0.5
Pregnancy induced hypertension(PIH)	1	0.5
Plasmodium falciparum malaria	1	0.5
Diabetesmellitus+hypertension	3	1.5
Unknown	24	12
Total	200	100.00

Most common etiology causing CKD was hypertension(93), followed by diabetes mellitus (42). The uncommon etiological diseases were cardiorenal syndrome, hepatorenalrenal syndrome, lupus nephritis, nephritic syndrome, plasmodium falciparum malaria, PIH, renal tuberculosis(1 each).The cause was unknown in 24 patients.

Table-2-Distribution of the cases according to stage

Stage	Male	Female
1	0	0
2	2	0
3	2	1

4	5	11
5	108	71
Total	117	83

Most of the patients had severe chronic kidney disease.

72(36%)patients were on Hemodialysis

Table 4-Distribution of cases on the basis of skin manifestations

Skin manifestations	Sex		Total	p-value
	Male (n=117)	Female(n=83)		
Xerosis	75	63	138	0.105
Pruritus	37	20	57	0.001
Pallor	14	24	38	0.001
Hyperpigmentation	30	24	54	0.134
Pupura	9	16	25	0.132
Pseudopophyria	2	3	5	0.234
Acquired perforating disorder	5	0	5	0.148
Drug rash	1	2	3	0.121
Yellow pigmentation	12	5	17	0.872
PPKD	0	3	3	0.64
Finger papules	1	0	1	0.21
Necrobiosis lipoidica	3	0	3	0.22
Eczema	3	3	6	0.325
Exfoliative dermatitis	1	1	2	0.254
Melasma	0	1	1	0.23
Senile comedons	5	0	5	0.226

Seborrheic keratosis	3	7	10	0.067
IGH	7	7	14	0.25

Xerosis was the most common manifestation overall, seen in 75(37.5%) males and 63(31.5%) females. Pruritus was observed in 57(28.5%) patients in our study. It was seen in 37(18.5%) males and 20 (24.1%) females. Diffuse hyperpigmentation over exposed areas was seen in 30(15%) males and 24(12%) females. Pallor was seen in 14(7%) males and 24(12%) females. Purpura was appreciated in 9(4.5%) males and 16(8%) females. Yellow pigmentation was seen in 12(6%) males and 5(2.5%) females. Among specific manifestations, pseudoporphyria was seen in 5(2.5%) patients. Acquired perforating disorder was observed in 5(2.5%) patients. Many patients had combined cutaneous feature.

**Discussion**

Chronic kidney disease (CKD) is a progressive loss of kidney function over a period of months or years through five stages. The number of patients with endstage renal disease (ESRD) in India is increasing. Dermatologic abnormalities are common in chronic kidney disease (CKD) and range from the nearly universal xerosis and pruritus to uncommon conditions such as hyperpigmentation of exposed areas, purpuric skin changes, acquired perforating dermatosis, and nail abnormalities<sup>3</sup>. In a study by Szepietowski JC et al. all patients with CKD had one or more skin manifestations.<sup>4</sup> Hypertension and Diabetes mellitus have been seen to be responsible for more than 50% of new cases of ESRD. Cystic/hereditary kidney diseases were the next most common causes. The remaining causes of ESRD included vasculitis, infectious or rheumatologic disease, interstitial nephritis, tumors, cholesterol emboli, and systemic amyloidosis. Infectious causes of glomerulonephritis included streptococcal infections, human

immunodeficiency virus (HIV), and hepatitis viruses, both hepatitis C (HCV) and hepatitis B (HBV). Thomas E et al et al was also reported that Hypertension and Diabetes mellitus to be responsible for CKD.<sup>5</sup> Xerosis was the most common cutaneous abnormality (68%), which is comparable with other studies.<sup>6,7</sup> A reduction in the size and functional abnormality of eccrine sweat glands, causing epithelial dehydration may contribute to the development of xerosis. Clinical and histologic evaluations have shown an overall decrease in sweat volume in patients with uremia, as well as atrophy of sebaceous glands. Some patients may develop acquired ichthyosis. Dry, lusterless hair and sparse body hair could also be attributed to the decreased sebaceous activity. Diffuse hyperpigmentation accentuated in sunexposed areas, seen in many patients is characteristic of uraemic patients. Thomas E et al<sup>5</sup> reported that pigmentary alterations occurred in 28.0% of dialysis patients and increases over the duration of renal disease. An increase in melanin in the basal layer of the epidermis due to an increase in poorly dialyzable betamelanocyte stimulating hormone can explain the pigmentation on sunexposed areas.<sup>6</sup> The intensity of melanin pigmentation increases with respect to the duration of endstage renal disease. A yellowish tinge of the skin was reported in 35% of patients by Szepietowski JC et al.,<sup>4</sup> but we encountered yellowish discoloration in only 17 (8.5%) patients, probably because of the dark complexion of Indians, which masks this finding. This has been explained by retained lipid soluble pigments such as lipochromes and carotenoids, deposited in the dermis and subcutaneous tissue. Pruritus is one of the most characteristic and troublesome symptoms of CKD. Generalised pruritus was recorded in 28.50% of patients in our study. It has been reported to be the second most common skin symptom in CRF, with a

prevalence of 20% to 48% in renal disease in various studies.<sup>8,9</sup>

There are a number of proposed etiologies for pruritus in CKD including changes related to xerosis, uremia, calcium and phosphate dysregulation, mast cell proliferation with a concomitant increase in histamine levels, hormonal derangement and hypovitaminosis D. Parathyroid hormone and divalent ions (eg, calcium phosphate and magnesium ions) have been implicated, as is seen with severe secondary hyperparathyroidism but these findings lack consistent correlation.<sup>9</sup>

### Conclusion

Recent advances in the treatment have improved the quality of life and life expectancy of these patients, resulting in changes in the frequency and types of disorders observed in CKD. Some prophylactic measures can prevent some of the cutaneous manifestations, such as emollients for xerosis and pruritus, sun screens, avoidance of sun exposure and adequate clothing for pigmentary changes, and cutaneous malignancies.

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