



CUTANEOUS MANIFESTATION IN CHRONIC KIDNEY DISEASE PATIENTS UNDER HAEMODIALYSIS

Medicine

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ABSTRACT

Background- This study aimed to evaluate and analyze the pattern of cutaneous manifestations in CKD patients under hemodialysis. **Methodology-** The present study was conducted as a prospective observational study at Department of Medicine, Hamidia Hospital, Bhopal for a period of 2 years on 100 patients with CKD on maintenance hemodialysis. A detailed history was taken and a complete dermatological examination was performed. Digital photograph of skin lesions were taken and all the patients were then subjected to relevant investigation. Viral marker was performed when clinically indicated. **Results-** Mean age of patients was 40.85 ± 14.58 years and majority of patients were males (70%). Mean duration of hemodialysis was 1.59 ± 1.50 years. Most common cutaneous manifestations in patients with CKD was xerosis (26%) followed by pruritis (12%), eczema (12%) and scabies (8%). Other less common cutaneous manifestations. **Conclusion-** Cutaneous manifestations are common in patients with CKD. Among various manifestations, most common cutaneous manifestations of CKD were xerosis, pruritis, eczema and scabies. Prophylactic preventive measures can reduce the adverse effects of cutaneous symptoms. Early recognition of cutaneous manifestations in CRF can improve outcome and reduce patient sufferings.

KEYWORDS

Cutaneous manifestation, CKD, xerosis, pruritis, hemodialysis

INTRODUCTION

Chronic Kidney Disease (CKD) is defined as, kidney damage or glomerular filtration rate (GFR) < 60 mL/min/1.73 m² for 3 months or more, irrespective of the cause.^[1] Hemodialysis has emerged as one of the therapeutic options which have drastically improved the life expectancy of patients within CKD.^[2] Long standing kidney disease have been associated with various skin manifestations which can be specific and non-specific. Nonspecific manifestations include pruritis, skin color changes, xerosis, and half-and-half nails. Specific manifestations include acquired perforating dermatosis, bullous dermatoses, metastatic calcification, and nephrogenic systemic fibrosis.^[3] These cutaneous manifestations in patients with CKD have been attributed to the disease or to the treatment. Also the cutaneous manifestations may be secondary to various metabolic disturbances and due to immunosuppressive drugs.^[4,5] Cutaneous manifestations have been estimated in approximately 50-100% patients with CKD.^[6] These cutaneous disorders can precede or follow the initiation of hemodialysis treatment, and there are more chances to develop newer skin changes during the course of hemodialysis therapy, which may affect the quality of life and some conditions could even be life threatening.^[7]

An early identification of dermatological manifestation could help in diagnosis of CKD stages. Some conditions are easily diagnosed but can be difficult to manage. Others are less straightforward to diagnose, largely because of clinical similarities with more common diseases, and they are notoriously difficult to manage.^[8] The dermatological complications can impair the quality of life significantly in affected individuals, therefore early diagnosis and treatment can greatly reduce the associated morbidity and mortality. The present study aimed to evaluate and analyze the pattern of cutaneous manifestations in CKD patients under hemodialysis.

METHODOLOGY

The present study was conducted as a prospective observational study at Department of Medicine, Gandhi Medical College and associated Hamidia Hospital, Bhopal for a period of 2 years i.e. from 1st September 2018 to 30th August 2020. A total of 100 patients with CKD belonging to age range of 15 to 70 years on maintenance hemodialysis of at least two dialysis/ week were included in the study whereas patients having 1 dialysis per week, belonging to less than 15 years of

age, with no cutaneous manifestations and not willing to report for follow up were excluded from the study.

After obtaining ethical clearance from Institute's ethical committee, written consent was obtained from all the study participants belonging to > 18 years of age whereas assent and consent was obtained from patients belonging to less than 18 years of age and their guardians respectively. Detailed data regarding sociodemographic variables was obtained from all the study participants and entered in questionnaire. A detailed history was taken and a complete dermatological examination was performed. Digital photograph of skin lesions were taken in such a manner to hide their identity. All the patients were then subjected to relevant investigation like CBC, Blood Urea, creatinine, Serum calcium, phosphate, sodium and potassium. Viral marker was performed when clinically indicated.

STATISTICAL ANALYSIS-

All the data analysis was performed using IBM SPSS ver. 20 software. Frequency distribution and cross tabulation was used to prepare the tables. Quantitative data was expressed as mean and standard deviations, whereas categorical data were expressed as numbers and percentage.

RESULTS-

The present study was conducted on a total of 100 patients with CKD on maintenance hemodialysis.

Table 1: Distribution of patients according to baseline variables

		Frequency	Percent
Age group (years)	≤ 20	8	8.0
	21-30	23	23.0
	31-40	23	23.0
	41-50	18	18.0
	51-60	18	18.0
	> 60	10	10.0
Gender	Female	30	30.0
	Male	70	70.0
Etiology	Acute Kidney Disease	4	4.0
	Diabetes mellitus	18	18.0
	HBSAG+HTN	2	2.0

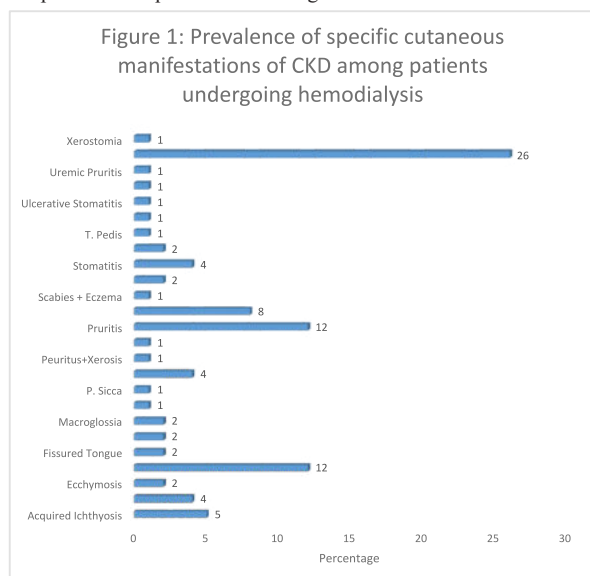
Duration of hemodialysis	HTN with T2DM	15	15.0
	Hypertension	61	61.0
	<1	51	51.0
	1-3	45	45.0
	3-5	1	1.0
	>5	3	3.0

Mean age of patients was 40.85 ± 14.58 years and majority of patients with CKD belonged to 21-40 years (46%) of age followed by 41-60 years (36%). CKD was more prevalent in males (70%) as compared to females (30%). Our study documented that hypertension (61%) followed by diabetes mellitus (18%) were the most common etiology of CKD. Mean duration of hemodialysis was 1.59 ± 1.50 years and majority were on maintenance hemodialysis for the less than 1 year (51%) whereas 45% had duration of hemodialysis between 1 and 3 years. Only 3% patients had duration of more than 5 years.

Table 2- Distribution according to investigations

Characteristics	Minimum	Maximum	Mean	Std. Deviation
Sodium	130	156	140.15	11.25
Potassium	2.5	9	5.64	1.47
S Urea	80	250	160.87	39.49
Creatinine	3	16	8.08	1.99
S CA	5.5	9.6	8.09	7.13
Po4	1.6	8.5	5.06	1.20
Hemoglobin	4	10	7.04	1.75

Mean Sodium, Potassium, serum urea, creatinine, Serum calcium, Po4 and hemoglobin was 140.15 ± 11.25 , 5.64 ± 1.47 , 160.87 ± 39.49 , 8.08 ± 1.99 , 8.09 ± 7.13 , 5.06 ± 1.20 and 7.04 ± 1.75 respectively. About 3% patients were positive for HBsAg viral markers.



Most common cutaneous manifestations in patients with CKD was xerosis (26%) followed by pruritis (12%), eczema (12%) and scabies (8%). Other less common cutaneous manifestations are depicted in figure 1.

DISCUSSIONS

Cutaneous manifestations are common in all stages of CKD particularly towards ESRD with a prevalence of 50–100%.^[6] 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 arteriopathy (calciophylaxis), 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.^[9] These manifestations may also vary across regions, with individual

dietary habits, socioeconomic and nutritional status, and racial differences.^[2] Because there are no data on the pattern of cutaneous manifestations in CKD patients from this part of the country, this study was carried out.

In present study, mean age of patients with CKD was 40.85 ± 14.58 years. Only 10% patients belonged to elderly age group and other were less than 60 years of age indicating higher prevalence of CKD in younger age group. However, mean age of patients with CKD was slightly higher in a study by Rashpa et al (57.5 ± 14.0 years)^[10] and Asokan et al (53.2 years)^[11]. Male predominance was observed for CKD with male:female ratio of 2.3:1. Similar findings were documented by previous studies.^[10,11]

Mean duration of hemodialysis was 1.59 ± 1.50 years, however, maximum patients were on hemodialysis for less than a year (51%). In line with present study findings Rashpa et al reported that majority of the CKD patients (41%) were on hemodialysis for $1 \square 42$ (9.3 ± 9.0) months.^[10] Asokan et al also reported the duration of dialysis in the range between 3 months to 8 years, with maximum number of patients (27) between 1-12 months (30.7%).^[11]

Our study included all the patients with cutaneous manifestations and most common manifestation in CKD patients was xerosis observed in 26% cases. Uday kumar et al also reported xerosis (79%) as the most common cutaneous manifestation amongst patients with CKD.^[7]

Pruritus is one of the most characteristic and annoying cutaneous symptoms of CRF.^[12,13] It is not present in acute renal failure and does not necessarily subside with dialysis although it improves with kidney transplantation.^[13] Its prevalence among hemodialysis patients ranges from 19 to 90%.^[14] In present study prevalence of pruritus was 12%. The etiology of pruritus in CRF is unknown. However, it has been associated to the degree of renal insufficiency (urine output of <500 ml),^[3] secondary hyperparathyroidism; xerosis^[15], increased serum levels of magnesium, calcium and phosphate, aluminum; increased serum levels of histamine; proliferation of nonspecific enolase-positive sensory nerves in the skin; hypervitaminoses A; and iron deficiency anemia.^[16]

We found high rates of eczema in present study which was 12%. Udayakumar et al in line with present study reported eczema at the site of an arteriovenous fistula and another at the site of the insertion of a catheter.^[7] Scabies and ichthyosis was observed in 8% and 5% cases respectively in our study, whereas Gnanasekaran et al documented their prevalence as 5% and 10% respectively.^[17]

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.^[12,18] Nutritional deficiencies, candidiasis, poor oral hygiene, smoking, consumption of alcohol or hot/spicy foods, dehydration, and mouth breathing remain overall possible pathogenetic triggers for fissured tongue.^[19] In present study prevalence of fissured tongue, koilonychia, macroglossia and tinea cruris was reported in 2% cases each. However, Rashpa et al reported the prevalence of fissured tongue in 7.4% cases and Koilonychia in 4.1% cases.^[10] Gnanasekaran et al reported koilonychia and macroglossia in 18% and 33% patients respectively, which were much higher as compared to present study.^[17]

Least common cutaneous manifestations observed in present study were tinea pedis, ulcerative stomatitis, uremic frost, xerostomia etc. Udayakumar et al^[7] did not reported any patients of tinea pedis though it is reported to be common findings in a study by Pico et al.^[3] Uremic frost, one of the rarer skin changes that can occur in the acute setting of severe uremia, was seen in 1% patients in present study. Previous studies have shown that this is mainly observed in those who had pre-dialysis blood urea level of more than 200 mg / 100 ml. In the pre-dialysis era, uremic frost was a frequent dermatologic finding, but it is rarely encountered nowadays due to the wide availability of hemodialysis.^[20] Udayakumar et al reported xerostomia in 31% patients and it was attributed to mouth breathing and dehydration.^[7]

Cross sectional nature and small sample size are the main limitation of the present study. A large randomized clinical trial is needed to provide strength to present study findings.



Fig. 2 Shows Xerosis Which Is Most Common Non Specific Cutaneous Manifestation In Chronic Kidney Disease Patient



Fig. 3 Shows Acquired Perforating Disorder Which Is Specific Cutaneous Manifestation In Chronic Kidney Disease Patient



Fig. 4 Shows Eczematous Changes In Chronic Kidney Disease Patient.

CONCLUSION

Cutaneous manifestations are common in patients with CKD. Among various manifestations, most common cutaneous manifestations of CKD were xerosis, pruritis, eczema and scabies. Other prevalent cutaneous manifestations of CKD were acquired ichthyosis, dermatitis, acquired perforating disorders, stomatitis, ecchymosis, fissured tongue, koilonychia, macroglossia, senile purpura and T. cruris. With the advent of Haemodialysis, the life quality of CRF patients has much improved. Prophylactic preventive measures can reduce the adverse effects of cutaneous symptoms. Early recognition

of cutaneous manifestations in CRF can improve outcome and reduce patient sufferings.

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