

## Original Research Article

# A study on dermatological manifestations among chronic kidney disease patients undergoing hemodialysis in a tertiary care centre

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### ABSTRACT

**Background:** Chronic kidney disease (CKD) is a progressive loss of kidney function over a period of months or years through five stages. The prevalence of end-stage renal disease (ESRD) in India is increasing with an estimated annual incidence of about 100 per million populations. About 50-100% of patients with ESRD have at least one associated cutaneous change. 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. Objectives of the study was to find out the prevalence of various dermatological manifestations in patients undergoing hemodialysis in a tertiary care centre.

**Methods:** A cross sectional study was carried out in the general medicine department of a tertiary care Centre. All cases of chronic kidney disease were diagnosed according to the criteria of KDQOI CKD guidelines, age group between 30-60 years are included. Pediatric patients with chronic kidney disease, patients who had renal transplantations, patients on peritoneal dialysis and renal injury patients are excluded.

**Results:** Out of the 100 study participants majority are males (60%). Majority of the patients belongs to lower socioeconomic status family (59%). Atleast one dermatological manifestation was present in all patients. 23% of the patients presented with two dermatological manifestations and 22% of the participants had three or more dermatological manifestations. Xerosis was the most common dermatological manifestation present among the patients.

**Conclusions:** This study reflects that quality of life in dialysis patients is mainly depend on timely recognition and prompt management of these dermatological conditions.

**Keywords:** Dermatological manifestations, Hemodialysis, Xerosis

### INTRODUCTION

Chronic kidney disease (CKD) is a progressive loss of kidney function over a period of months or years through five stages. The prevalence of end-stage renal disease (ESRD) in India is increasing with an estimated annual incidence of about 100 per million populations.<sup>1</sup> Hemodialysis is one of the therapeutic option which can improve the survival in these patients.<sup>2,3</sup> About 50-100%

of patients with ESRD have at least one associated cutaneous change.<sup>4</sup> 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. An early identification of dermatological manifestation could help in diagnosis of chronic kidney disease stages. Cutaneous examination of patients with ESRD has shown that 50-

100% of patients have at least 1 dermatologic condition. A high prevalence of cutaneous disorders is expected, because most patients with ESRD have an underlying disease process with cutaneous manifestations. Many factors are involved in the pathogenesis of the cutaneous manifestations of ESRD, including electrolyte imbalance, buildup of uremic substances, and comorbid disease. 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.<sup>5</sup>

There are different kinds of cutaneous alterations described in Chronic kidney disease like Xerosis, pruritus, pallor, hyperpigmentation, half and half nail, and brittle hair.<sup>6</sup> Earlier diagnosis and treatment of patients with chronic renal failure improves the quality of life and prolongs the life expectancy of these patients, giving time for newer cutaneous manifestations to develop. Various studies showed that 80% of chronic kidney patient have atleast one identifiable dermatologic disorder.<sup>7,8</sup>

So We intended to evaluate the prevalence of various dermatological manifestations in patients undergoing hemodialysis at our center

### Aims and objectives

To find out the prevalence of various dermatological manifestations in patients undergoing hemodialysis in a tertiary care centre.

### METHODS

It was a prospective cross sectional study conducted at General Medicine department, Sree Mookambika Institute of Medical Sciences for a period of 18 Months (October 2014-June 2016). 100 cases of both gender undergoing regular hemodialysis at least twice a week for a minimum of three months were evaluated. All the cases who fulfill the eligibility criteria during the study period were included. Sampling technique used in the study was convenient sampling.

#### Inclusion criteria

- All cases of chronic kidney disease were diagnosed according to the criteria of KDQI CKD Guidelines.<sup>9</sup>
- Age group between 30-60 years, patients willing to take part in the study.

#### Exclusion criteria

- Pediatric patients with chronic kidney disease.
- Patients who had renal transplantation.
- Patients on peritoneal dialysis and Renal injury patients.

### Parameters to be studied

Haemoglobin, serum urea, serum creatinine, serum calcium, serum phosphorus, skin biopsy, culture and sensitivity for bacterial infections, Gram's stain, potassium hydroxide mount and fungal culture

### Procedure in detail

After getting approval from Institutional Human Ethical Committee written informed consent was obtained from the patient before enrolling them into study. A detailed relevant history of patients was recorded including their basic demographic profile was noted. All the patients were subjected to haemoglobin, serum urea, serum creatinine, serum calcium, serum phosphorus and chest x-ray. Specific investigations like skin biopsy, culture and sensitivity for bacterial infections, Gram's stain, potassium hydroxide mount and fungal culture were done where indicated. The severity of xerosis was assessed by a modified version of the grading by Morton: grade 0 (smooth skin), grade 1 (rough skin) and grade 2 (rough skin with scaling) was recorded. Skin biopsy for histopathological examination of skin lesion was performed.<sup>10</sup>

### Data analysis

The study parameters entered in Microsoft Excel spread sheet and statistically analyzed using program R, version 3.00. Descriptive statistics was applied.

### RESULTS

Out of the 100 study participant's majority are males (60%). Majority of the patients belongs to lower socioeconomic status family (59%). 70% of the patients had family history of diabetes and hypertension. 40% of the participants had consume tobacco and alcohol. In the current study the mean duration of the dialysis was  $10 \pm 6.5$  months. Mean haemoglobin level was  $9.7 \pm 1.8$  gm%. Mean blood urea level was  $180 \pm 24.3$  mg%. Mean serum creatinine level was  $8 \pm 2$  gm%. Mean serum phosphorus and serum calcium level were  $7.2 \pm 2.5$  gm% and  $8.1$  gm%. Major causes of chronic kidney disease in the current study was diabetes mellitus (54%) followed by hypertension (20%) and chronic glomerulo nephritis (15%) (Table 1).

**Table 1: Causes of chronic kidney disease.**

Disease condition	Percentage (%)
Diabetes mellitus	54
Hypertension	20
Chronic glomerulonephritis	15
Chronic interstitial nephritis	6
Polycystic disease	3
Obstructive disease	2

The occurrence of dermatological manifestation was independent of age and gender. At least one dermatological manifestation was present in all patients. 23% of the patients presented with two dermatological manifestations and 22% of the participants had three or more dermatological manifestations. Xerosis was the most common dermatological manifestation present among the patients (77%). Among the xerosis majority of the patients had grade II xerosis (53%). The pallor was seen among 65% of patients. 53% of the patients present with nail changes. In nail changes half nail was present in 30% of the patients with nail changes. Beau's line (10%) and platynychia (8%) was also present among the patient with nail changes. Pigmentary changes were present in 50% of the patients. Dermatophytosis was the most common cutaneous infection (45%) seen among patients. 40% of the patients present with hair changes. Sparse hair (50%) was the most common presentation among hair changes followed by lusterless hair (49%). Pyoderma (10%) was also seen in patients. 30% of the patients had oral mucosa changes.

## DISCUSSION

Our study found that all patients had at least one dermatological manifestations which was similar to Nunley et al.<sup>4</sup> Shrestha et al found that 50% of the patients had at least one cutaneous manifestation.<sup>11</sup> In current study xerosis was the most common presentation among participants which was similar to Udayakumar P et al and Shrestha P et al.<sup>6,11</sup> In present study grade II xerosis was more common which was in accordance with Udhayakumar et al in Coimbatore, Tamil Nadu, India.<sup>6</sup> Studies done by Shrestha et al Dorchhom et al and found that grade 1 xerosis was more prevalent than grade 11 xerosis because large number of diabetic patients were present in that studies.<sup>12</sup> Weismen et al revealed that grade 1 xerosis is present in diabetes mellitus may be due to the reduction in size of eccrine sweat glands.<sup>13</sup> In present study 65% of the patients presented with pallor which was similar to studies done by Dorchhom et al and Udayakumar et al.<sup>6,12</sup> Pallor is due to anaemia seen in chronic kidney patients. Deficient erythropoietin production by the failing kidneys and dietary deficiencies of iron, folic acid, and vitamin B12 are the contributing factors to anaemia.

In the current study 53% of the patients have nail changes which was similar to Udayakumar et al in Coimbatore, Tamil Nadu, India.<sup>6</sup> In the present study 50% of the patients presented with pigmentary changes. Other studies also reported the range between 30%-50%.<sup>6,14,15</sup> Pigmentary changes occurred due to increased levels of  $\beta$ -melanocyte stimulating hormone and due to inadequate excretion through kidney and dialysis.<sup>16</sup> Prevalence of hair changes present in the current study was 40% which was higher compared with other studies.<sup>6,14</sup> 45% of the patients presented with dermatophytosis which was in accordance with a study done by Deskhmukh et al.<sup>15</sup> The

prevalence of oral mucosa changes was higher (30%) was compared with other studies.<sup>6,12,15</sup>

## CONCLUSION

Present study found that dermatological manifestations were found in all patients participated in the study. Most common dermatological manifestation was xerosis. Other common problems were pallor and pigmentary changes. Quality of life in dialysis patients is mainly depend on timely recognition and prompt management of these conditions.

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