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Dermatological manifestations in patients with chronic kidney disease

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Abstract
Dermatological manifestations in ESRD are varied and can impair the quality of life. Prompt diagnosis may help to ensure treatment which can in turn reduce the disease associated morbidity. Some prophylactic and remedial measures can prevent or decrease some of the adverse changes. These include emollients for xerosis, sunscreens and sun avoidance measures for pigmentary changes and cutaneous malignancies; oral hygiene to prevent oral mucosal changes; nutritional supplementation to prevent vascular fragility, angular cheilitis and hair loss; and prompt recognition and treatment of fungal infections like onychomycosis and tinea pedis, which are seen with increased incidence in CKD. Our study was conducted to evaluate the prevalence and pattern of cutaneous disorders among patients with chronic kidney disease.

Keywords: Chronic kidney disease, Pruritus, Hemodialysis, End stage renal disease, cutaneous manifestation

Introduction
Chronic kidney disease (CKD) is a progressive loss of kidney function over a period of months or years and is divided into five stages [1]. Chronic kidney disease (CKD) is defined as kidney damage or glomerular filtration rate <60 ml/min/1.73 m² for 3 months. Most patients with severe CKD progress to end-stage renal disease (ESRD) with significant morbidity and mortality [2]. About 50-100% patients with ESRD have atleast one associated cutaneous change [3]. CKD is associated with a complex array of cutaneous manifestations caused either by the disease or by treatment. Cutaneous manifestations in renal failure are polymorphic and diverse. Non-specific cutaneous disorders include pigmentary changes, pruritus, xerosis, acquired ichthyosis, and half-and-half nail. Specific disorders include acquired perforating dermatosis, calciphylaxis, bullous dermatoses, and fibrosing dermopathy of uremia [4, 5]. Although many of the patients with end-stage renal disease (ESRD)can improve their quality of life by hemodialysis, in case of denying kidney transplantation, prolonged hemodialysis itself will be associated with certain cutaneous and mucosal complications or changes in the type of dermatologic involvement and manifestations [6]. Dermatological manifestations in ESRD are varied and can impair the quality of life. Prompt diagnosis may help to ensure treatment which can in turn reduce the disease associated morbidity [7]. Some prophylactic and remedial measures can prevent or decrease some of the adverse changes. These include emollients for xerosis; sunscreens and sun avoidance measures for pigmentary changes and cutaneous malignancies; oral hygiene to prevent oral mucosal changes; nutritional supplementation to prevent vascular fragility, angular cheilitis and hair loss; and prompt recognition and treatment of fungal infections like onychomycosis and tinea pedis, which are seen with increased incidence in CKD [7, 8]. Our study was conducted to evaluate the prevalence and pattern of cutaneous disorders among patients with chronic kidney disease.

Materials and Methods
The study was undertaken from March 2017 to Feb 2018. 100 patients of chronic kidney disease above the age of 18 years with dermatological manifestation, attending Dermatology or Nephrology OPD at a Kanachur Institute of Medical Sciences, Mangalore. The subjects were enrolled in the study. CKD was diagnosed on the basis of GFR estimation.

Patients on maintenance hemodialysis were also included irrespective of the etiology of CKD. A detailed clinical history including demographic details, co morbidities, cause of CKD, family history, drug history, duration on Hemodialysis, previous history of skin diseases, were recorded in a proforma after obtaining informed consent from each individual patient. A detailed physical examination and dermatological examination was done and findings recorded. Relevant investigations like complete haemogram, diabetic profile, ANA, renal function tests, Liver function tests, electrolytes, viral markers, serum calcium, phosphorous and PTH levels, KOH mount, culture & sensitivity, wood s lamp examination, biopsy was done when indicated.

Results

Table 1: Skin changes in patients of chronic kidney disease

Skin Changes	No. Of patients (n=100)
Pruritus	70
Xerosis	71
Hyperpigmentation	21
Eczema	33
Acquired perforating dermatoses	07
Purpura/Echymosis	06
Calciphylaxis	02
Acquired icthyosis	12
Bullous dermatoses	05
Herpes zoster	02
Candida infection	10
Dermatophytosis	35
Bacterial infection	06

Table 2: Nail changes in patients with chronic kidney disease

Nail changes	No. of patients (n=43)
Half and Half nail	19
Onychomycosis	28
Onycholysis	04
Subungual hyperkeratosis	08
Nail dystrophy	05

Table 3: Hair changes in patients with chronic kidney disease

Hair changes	No of patients (n=47)
Brittle hair	32
Premature greying	26
Telogen effluvium	05
Seborrheic dermatitis	03

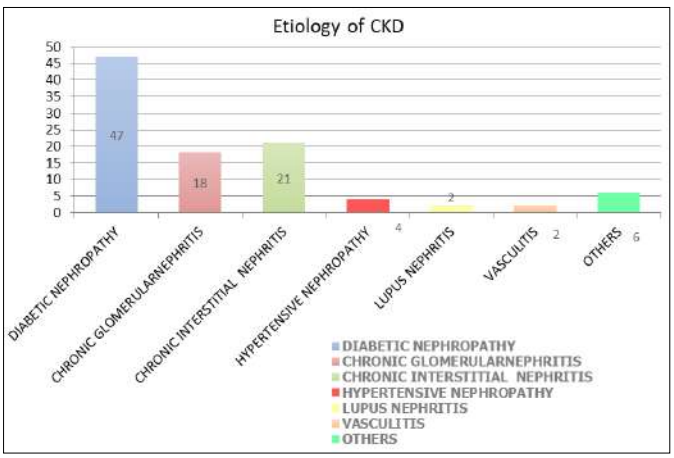

Fig 1: Pie diagram showing etiology of chronic kidney disease

Discussion

Dermatological manifestations in CKD patients is varied and severity of which can vary from mild to severe, disturbing the life style of patients. These features can be under diagnosed and hence prompt and timely identification and intervention can improve quality of life in this population.

We included 100 subjects with CKD including those on Haemodialysis. 42% were on MHD and 58% were on conservative management, similar to a study by Navya sahadevan *et al.* [8] from south India which also included 100 subjects but majority 61% were on MHD and 39% on conservative management.

Males constituted majority of our study group of about 65% with the mean age of 46.8±13.6, females constituted 35% and the mean age among them was 49.2±14.5 years. Similar to a study by udaykumar P *et al.* [7] where males constituted 70% of the study group and females-30% with the mean age being 45 years.

In our study, among those on MHD(42%), majority of them i.e. 40.4% were on haemodilaysis of > 5 years duration with a mean of 8.4±4.2 years, in contrast to a study done by *rashpa et al.* [2] in which the mean duration of haemodialysis was 9.3±9 years which was higher than our study. The most common cause of CKD in our study was found to be diabetic nephropathy which was seen in 47%, similar to study by navya sahadev *et al.* [8] where diabetic nephropathy was seen in 49% of their total study population. In another study by rashpa *et al.* [2] diabetics constituted 56.6% of their study group.

Mean haemoglobin was found to be 7.3±3.8g/dl in our study similar to a study done by Praveen kumar *et al.* [9] in which the Mean haemoglobin was found to be 7.8±3.1g/dl.

Pruritus was the most common dermatological manifestation seen in our study in 73% (n=73) of the total study population followed by xerosis in 68% (n=68). Similar observation was noticed in previous studies with a prevalence of 40–90% [10]. High dosage of diuretics, atrophy of sweat glands, and excessive ultra- filtration during haemodialysis might be responsible for the above manifestation.

Generalized hyperpigmentation was seen in 32%(n=32) in our study with similar reported prevalence of 22-54% [11, 12].

Other dermatological lesions found in our study were chronic eczema in 20%, acquired icthyosis in 14%,Acquired perforating dermatosis in 7%, purpura and ecchymosis in 5%,bullous dermatosis in 3% and calciphylaxis in 01 patient. Similar lesions were found in other studies [13-16].

Among the dermatological infections dermatatophytosis was most common seen in 35%of the total study population. Similar to a study done by rashpa *et al.* which also showed that the fungal infections were seen in about 38.5% of their study group. Prevalence in other studies have found to be 28–70% due to increased susceptibility for bacterial, fungal, and viral cutaneous infections due to reduced immunity [17, 18]. Among the nail and hair changes most commonly seen was onychomycosis in 58% and brittle hair was in 79% of our study group, which corroborates with the reported prevalence of 30–70% [19, 20].

In our study we found high prevalence of dermatological manifestations among patients on haemodialysis which was statistically significant with $p<0.05$ as compared to those on conservative management. This was in contrast to a study done by rashpa *et al.* [2] where higher incidence of

dermatological manifestations were seen in CKD stage 5 disease probably because of higher number of patients included belonged to CKD stage 5.In another study with large sample size by pisoni *et al.* [21] independent and strong relationships were noted between pruritus and elevated levels of serum phosphorus, serum calcium, and serum calcium phosphorus product, though we did not find any significant relation between them.

Conclusion

Long follow up is needed to reduce the morbidity associated with dermatoses. An inter-disciplinary approach involving dermatologists and nephrologists is essential to improve the quality of life of patients with ESRD.

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