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End stage renal disease (ESRD) - Dermatologist perspective / Dermatological manifestations

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Introduction

About 50–100% of patients with end-stage renal disease have at least one associated cutaneous change. (1)

Cutaneous manifestations in renal failure are polymorphic and diverse. They may range from asymptomatic to life-threatening forms. They may occur before or after initiation of dialysis and can be divided into: Specific and non-specific.[2] Pruritus, xerosis, pigmentation disorders, and half and half nails (Lindsay's nails) are included under non-specific and acquired perforating disorders (APD), bullous dermatoses, calcifying disorders, and nephrogenic systemic fibrosis are included under specific manifestations of ESRD.[3] Their early recognition and treatment are essential in reducing morbidity and mortality.

The number of patients with end-stage renal disease (ESRD) in India is increasing with an estimated annual incidence of about 100 per million populations [4]

Many factors are involved in the pathogenesis of the cutaneous manifestations of ESRD, including electrolyte imbalance, buildup of uremic substances, and comorbid disease[5].

Materials and methods

A descriptive study was conducted in 250 patients with End sage renal disease of diverse etiology who attended the nephrology or dermatology department of a tertiary care hospital from February 2021 to august 2022. Written informed consent was given by individual study participants.

A detailed clinical history, onset and progression of cutaneous symptoms, history regarding renal disease, treatment history, history of any skin disease, and history of any comorbid condition were recorded. A detailed physical and dermatological examination was done in all cases. Dermatological manifestations observed were documented.

Complete hemogram, urine routine and microscopy, blood urea, serum creatinine, serum electrolytes, blood sugar, serum calcium, serum phosphate, liver function test and serology for human immunodeficiency virus (HIV), hepatitis C virus, and hepatitis B virus were done in all patients. Antinuclear antibody (ANA) and ANA profile were done when indicated. Skin biopsy was carried out when the diagnosis was doubtful.Data were entered in Microsoft Excel and analyzed with IBM SPSS version 20.0

Results

The total of 250 patients were included in this study of which 175 (70%) were males and 75(30%) were females (male to female ratio 2.3:1).

The age of the patients ranged from 13.5 years to 75 years. The youngest male and female patients were of 13.5 years and 23 years while the oldest were of 75 years and 73 years, respectively. Maximum number of patients belonged to 51– 60-year age group with mean age of 49.5.Causes of end stage renal disease in our study is as follows

Table 1: Causes of end stage renal disease in study participants.

Causes	No. of patients (percentage)
Diabetic nephropathy	125(50)
Chronic tubulointerstitial nephritis	30(12)
Chronic glomerulonephritis	25(10)
Ischemic renal failure	15(6)
Nephritic syndrome	15(6)
IGA nephropathy	15(6)
Lupus nephritis	10(4)
Obstructive nephropathy	10(4)
Hypertensive nephrosclerosis	5(2)
AD polycystic kidney disease	5(2)
Pauci immune vasculitis	3(1.2)

Out of 250 patients 150 patients were on dialysis and 100 patients were on conservative treatment All the study participants had at least one specific or non-specific dermatological manifestation of ESRD.

In 150 patients (60%) pallor was seen. Hemoglobin ranged from 5 g% to 11.8 g%. It was seen in 48 patients (48%) on conservative treatment and 108 patients (72%) on hemodialysis. Xerosis was seen in 155 cases (62%). 115 patients (46%) on conservative treatment and 175 patients (70%) on hemodialysis had xerosis.

Hundred and fifteen patients (46%) complained of pruritus, of which 170 (68%) were males and 80 (32%) were females. 115 (46%) conservative treatment and 110 (44%) on hemodialysis had pruritus.

Diffuse hyperpigmentation in sun exposed areas was noted in 55 patients (22%). 15 patients (15.4%) on conservative treatment and 39 patients (26.2%) on hemodialysis had pigmentary changes

APD was seen in 17 patients (7%). Clinically, all of them manifested pruritic keratotic papules with central keratin filled crater mainly on the extensor aspect of extremities and trunk, suggestive of Kyrle's disease [Figure 1].

Four patients showed Koebnerization. 26 patients (10.3%) on conservative treatment and three out of the 12 patients (4.9%) on hemodialysis had APD.

Nephrogenic systemic fibrosis was seen in two patients (0.8%); both had diabetes and were on hemodialysis.

Eighty-three patients (33%) had pedal edema and one each showed purpura and ecchymosis, respectively.

Nail changes were noted in 152 patients (61%). 56 patients (56.4%) on conservative treatment and 64 patients (63.9%) on hemodialysis showed nail changes.

Table 2

Nail changes	Number (percentage)
Longitudnal ridging	125(50)
Leukonychia	37(15)
Nail dystrophy	37(15)
Onycholysis	20(8)
Nail pigmentation	15(6)
Bues line	15(6)
Piting	15(6)
Subungual hyperkeratosis	25(10)
Half and half nails	10(4)
clubbing	10(4)

Hair changes were observed in 73 patients (29%). Dry luster less hair was observed in 58 patients (23%), telogen effluvium in 38 patients (15%), and sparse body hair in 15 patients (6%).

Lupus hair was observed in 7 patients (3%) with lupus nephritis.Hair changes were seen in 13 (12.8%) patients on conservative treatment, and in 97 (39%) patients on hemodialysis.

Oral mucosal changes observed among study participants were glossitis (80,32%), cheilitis (28,11%), hyperpigmentation of oral mucosa (32,13%), macroglossia (17,7%), and xerostomia (7,3%).

Other cutaneous manifestations documented in study participants included folliculitis (10,4%), furuncle (3,1%), tinea corporis (17,7%), tinea versicolor (10,4%), candidal intertrigo (7,3%), verruca vulgaris (3,1%), diabetic shin spots (13,5%), psoriasis (7,3%), peripheral occlusive vascular disease (7,3%), nummular eczema (5,2%), asteatotic eczema (3,1%), contact dermatitis (3,1%), photodermatitis (3,1%), lichen planus (3,1%), phrynoderma (2,1%), seborrheic keratosis (3,1%), malar rash (3,1%), and subacute cutaneous lupus erytheMatos us (3,1%). No cases of adverse drug reactions were noted in the study.

Discussion

Diabetes mellitus documented as the most common cause of ESRD by us, was consistent with the literature.[6]

Pico et al. had reported at least one dermatological alteration in all his study participants with ESRD, which was comparable to our observation.[1]

Sixty-four percentage of the study population manifesting pallor was consistent with existing literature.[3]

The frequency of 61% noted for xerosis by us fell between the 50% and 85% reported by others. [7,8]

The male predominance for pruritus was observed by Masmoudi et al.[2] This was contradictory to our finding of pruritus in 40.3% of males and 60.7% of females.

The frequency of pruritus noted by us (46%) was concordant to the reported frequency of 40%–90%.[9]

The frequency of hyperpigmentation observed in the study was comparable to the literature.[10] Diffuse hyperpigmentation on sun exposed areas, as noted by us is attributed to an increase in melanin in the basal layer and superficial dermis due to the failure of the kidneys to excrete beta-melanocyte stimulating hormone.[11]

Kyrle's disease is seen in 2%–11% of patients on dialysis as per literature.[3] We found a higher proportion of ESRD patients on conservative treatment manifesting the same (10.3% in those on conservative treatment and 4.9% in those on hemodialysis). All seven patients (irrespective of whether they were on hemodialysis or not) with Kyrle's disease being diabetics could be attributed to the former being a manifestation of diabetes mellitus itself.[12]

The frequency of half and half nails (3%) noted by us was lower than the 20% reported by others.[3]

Glossitis and cheilitis in ESRD may be attributed to nutritional deficiency diseases such as riboflavin deficiency, iron deficiency anemia, and zinc deficiency.[13] Teeth indentation with macroglossia was first reported in 1986 by Mathew et al. in 92% patients with chronic renal failure.[14] Uday Kumar et al. had reported macroglossia in 35% cases.Thomas et al. documented macroglossia in 9.09% cases alone and this was comparable to our findings (7%).[13] Xerostomia in ESRD is attributed to dehydration and mouth breathing.[15]

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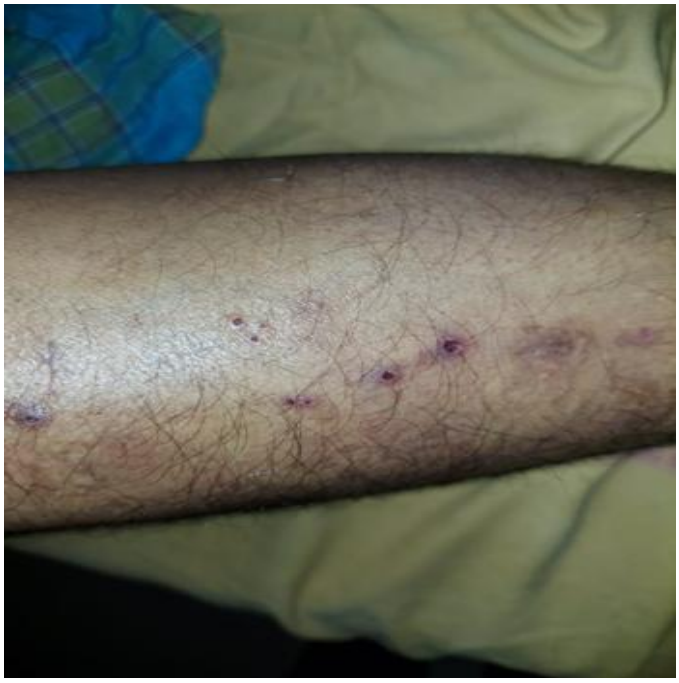

Figure 1: kyrle's disease in CRF

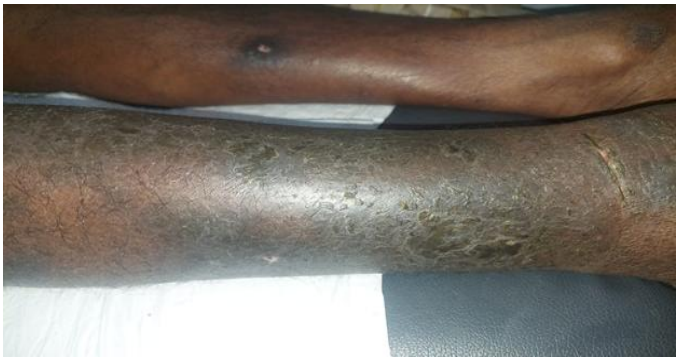

Figure 2: cachyphylaxis

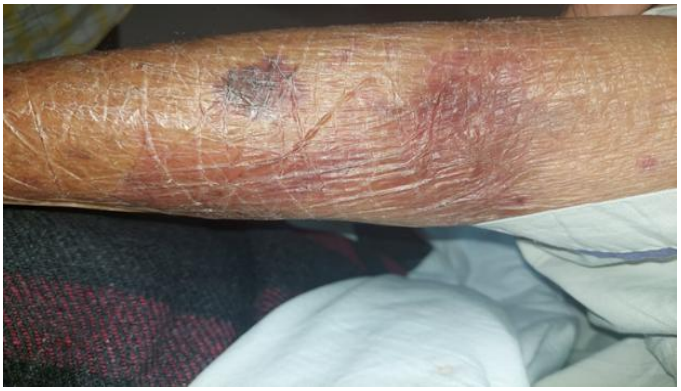

Figure 3: Ecchymosis and purpura in renal failure patient

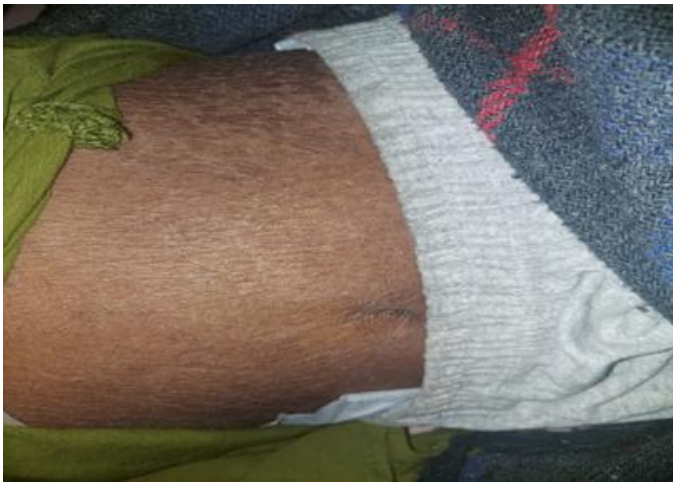

Figure 4: Generalised xerosis in ESRD patient