

Dermatological Manifestations in Patients with End-Stage Renal Disease at the Hemodialysis Center in Merjan Hospital at Babylon Province, Iraq

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Abstract

Background: Chronic kidney disease (CKD) refers to an irreversible deterioration in renal function which ordinarily develops over a period of years. Many cutaneous anomalies have been encountered in patients with end-stage renal disease that precedes or follows the initiation of dialysis treatment or kidney transplantation. Manifestations such as pallor, pruritus, xerosis, or even hyperpigmentation and perforating disease are commonly exhibited in such patients. **Objective:** The aim of this study is to estimate the prevalence of cutaneous manifestations in patients with CKD undergoing hemodialysis. **Materials and Methods:** A cross-sectional study involved 103 patients with CKD at the hemodialysis center of Merjan Teaching Hospital, Babylon province, Iraq. **Results:** Many dermatological manifestations were diagnosed in patients of this study ranging from xerosis (85%) and pallor (82%) to calcinosis cutis (1%) and perforating disease (1%). Forty percent of our patients had a 2-year history of dialysis, 50% possess between 2 and 6 years, whereas the remaining 10% were compelled to have hemodialysis for more than 6 years. Cutaneous manifestations were found in 97% of patients. **Conclusions:** There is a high prevalence of cutaneous changes found in patients with CKD undergoing hemodialysis.

Keywords: Chronic kidney disease, cutaneous manifestations, end-stage renal disease, hemodialysis

INTRODUCTION

The term chronic kidney disease (CKD) alludes to an irreversible deterioration in renal function which ordinarily develops over a period of years. Initially, it manifests only as a biochemical abnormality but, inevitably, loss of the excretory, metabolic, and endocrine functions of the kidney leads to the clinical symptoms and signs of renal failure, which collectively referred to as uremia.^[1]

The daunting term end-stage renal disease (ESRD) pointing to a stage of CKD in which there will be a huge accumulation of toxins, fluids, and electrolytes that are normally excreted by the kidneys results in the uremic syndrome. This syndrome leads to death unless the toxins are removed by renal replacement therapy, using dialysis or kidney transplantation.^[2]

Patients with ESRD are usually suffering from Many cutaneous anomalies that may precede or follow the initiation of dialysis treatment or kidney transplantation.^[3]

Inclusively, the striking feature of patients with CKD is changes in skin color. Ordinarily, as a result of anemia caused by chronic disease, pallor is commonly present. Similarly, hyperpigmentation may also occur and is often photodistributed.^[3]

Elastosis is frequently seen in patients with ESRD, often distributed in sun-exposed areas. Ecchymoses are common, secondary to platelet dysfunction. The skin can appear xerotic and in more severe cases may demonstrate ichthyosiform scaling.^[3]

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Uremic frost is a terminal event that is now rarely seen. It can be recognized by superficial white deposits that are secondary to crystallized urea excreted from sweat.^[3] Half-and-half nails or Lindsay's nails have been described in one-third of patients with azotemia.^[3]

The proximal half of the nail appears white because of edema of the nail bed and capillary network.^[3] Pruritus is the most frequent symptom of ESRD, experienced by 58%–90% of patients undergoing maintenance dialysis.^[4,5]

Uremic pruritus can be localized or generalized.^[6] The frequency and severity of symptoms vary, often with intermittent intense paroxysms that disrupt sleep and observed in ESRD (acquired perforating dermatosis, [APD]) share features with the primary perforating dermatoses (i.e., Kyrle's disease, perforating folliculitis, and reactive perforating collagenosis).^[7,8]

Metastatic calcification is the precipitation of calcium salts in the normal tissue due to defects in calcium or phosphate metabolism,^[9] one observes firm papules, plaques, and nodules [Figure 1]. A chalky discharge may be extruded from these lesions through the epidermis.^[9]

Calciophylaxis is a devastating and life-threatening condition of progressive cutaneous necrosis secondary to small vessel calcification.^[10] Calciophylaxis presents clinically as firm, bilaterally symmetric, exquisitely painful purpuric plaques or nodules, often with a reticulated pattern resembling livedo reticularis.^[11]

The clinical presentation of porphyria cutanea tarda (PCT) associated with ESRD does not differ from that observed in sporadic PCT induced by other agents.^[12] Pseudoporphyria is used to describe patients with clinical and histologic features similar to PCT without abnormal porphyrin levels.^[13]

MATERIALS AND METHODS

Study design and patients

This is an epidemiological descriptive study conducted in the Nephrology Department in Marjan Teaching Hospital from March 2019 to November 2019. One hundred and three patients with ESRD were included in this study. There were 59 (57%)

males and 44 (43%) females. Their ages ranged between 12 and 72 years. Dermatological examination was done for each patient searching for any cutaneous manifestations. Hemodialysis was accomplished for all patients. Hepatitis C and B were occurred as a complication of hemodialysis in 47 (46%) and 5 (5%), respectively.

Statistical analysis

Data entry and statistical analysis were carried out using the Statistical Package for the Social Sciences (SPSS) version 22 (SPSS, IBM Company, Chicago, IL, USA).

Ethical consideration

The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with patients' verbal approval before the sample was taken. The study protocol and the subject information and consent form were reviewed and approved by a local ethics committee (Babylon Health Directorate, Iraq).

RESULTS

This study included a total sample of 103 patients; 59 (56%) of the participants are male and 44 (44%) are female.

The age of the patients ranged from 12 to 72 years (mean $42 \pm$ standard deviation years) [Figure 2]. About 80% of the participants aged above 80 years, whereas only two patients (1.9%) are below 20 years.

Results found that 40% of our patients had a 2-year history of dialysis, 50% possess between 2 and 6 years, whereas the remaining 10% were compelled to have hemodialysis for more than 6 years [Figure 3].

Due to financial, medical, and other causes, only 3.6% of the participated patients had a kidney transplantation [Figure 1].

Cutaneous manifestations found in 100 (97%) patients. The most common cutaneous manifestation was xerosis (dry skin) which has been seen in 87 (84%) patients, followed by pallor (84 patients). The prevalence of different dermatological manifestations is illustrated in Figure 4.

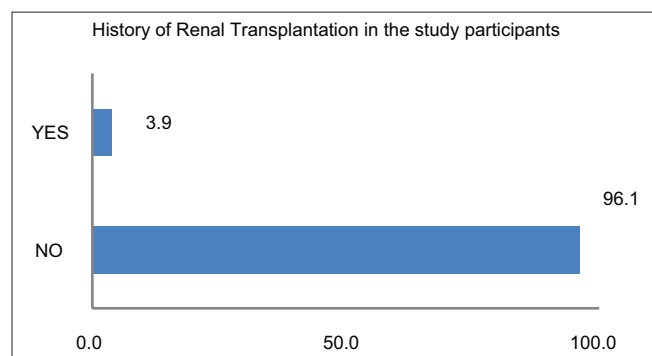


Figure 1: Study participants by their duration of dialysis ($n = 10$)

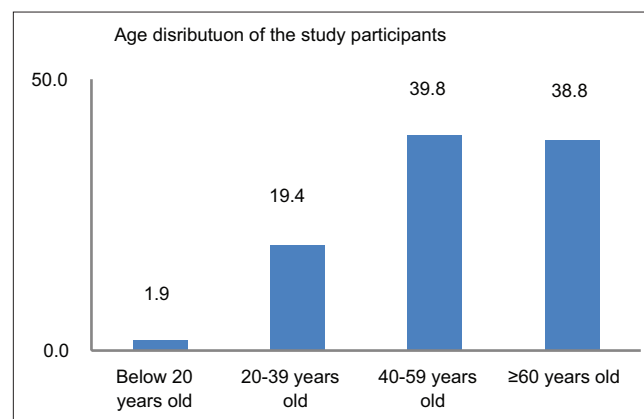


Figure 2: Study participants by their age ($n = 103$)

Pruritus was seen in 62 (60.2%) patients, 34 (55%) of those were mild, 14 (22.5%) were moderate, and 14 (22.5%) were severe. Thirty-nine patients (60%) of those with pruritus got relief after hemodialysis, whereas in other 21 (32%) patients, hemodialysis did not affect their itching. Contrary to that, itching was aggravated by hemodialysis in 5(8%) patients in this study [Figure 5].

Similarly, hyperpigmentation was found in 51 patients (50%). Cutaneous infections were present in 14 (14%) patients (viral, bacterial, and fungal).

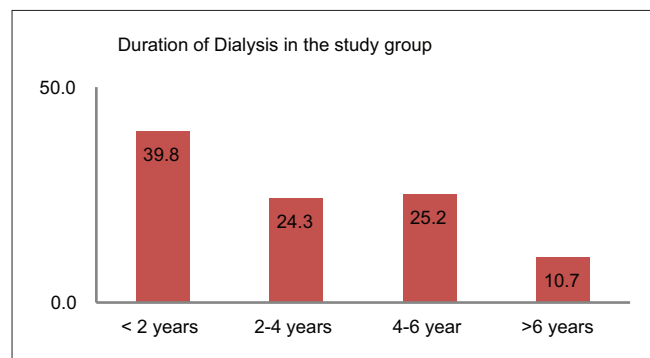


Figure 3: Study participants by their duration of dialysis ($n = 103$)

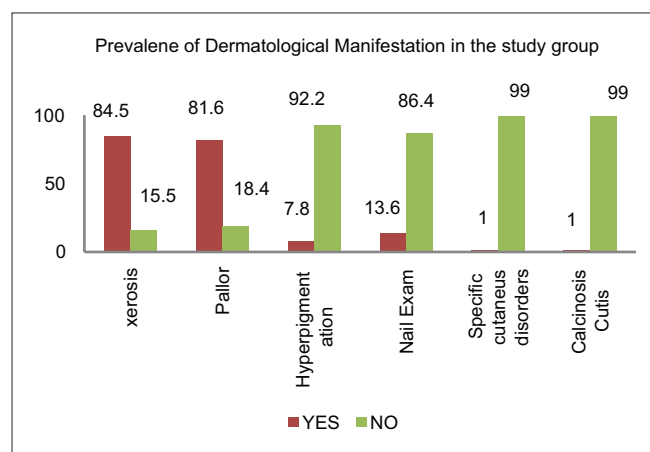


Figure 4: Rates of the cutaneous manifestations in the study participants ($n = 103$)

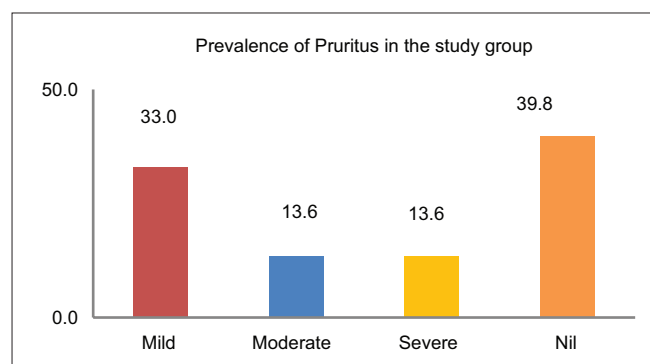


Figure 5: Prevalence of the pruritus in the study participants ($n = 103$)

Other cutaneous manifestations that have been seen in our patients are as follows: ecchymosis in 22 (21%) patients, half-and-half nail in 13 (13%) patients, systemic lupus erythematosus (SLE) cutaneous features (malar rash, photosensitivity, and discoid lesion) in 3 (3%) patients, perforating disease in 2 (2%) patients [Figures 6 and 7], calciphylaxis in 2 (2%) patients, and finally, only one patient (1%) diagnosed with tuberous sclerosis skin lesions (angiofibroma and ash-leaf macules), whereas cutaneous manifestations such as bullous disease (porphyria and pseudoporphyria) and uremic frost were not seen in the participants of this study.

Although 47 (46%) patients had hepatitis C and 5 (5%) patients had both hepatitis B and C, no specific cutaneous findings of hepatitis B and C were noted [Figure 8].

DISCUSSION

In chronic renal failure, there is an irreversible deterioration in renal function. The resulting impairment of the excretory, metabolic, and endocrine functions of the kidney leads to the development of the clinical syndrome of uremia. The aim of all renal replacement techniques including hemodialysis^[3] is to mimic the excretory functions of the normal kidney. These include excretion of nitrogenous wastes, maintenance of normal electrolyte concentrations, and extracellular volume.^[1,3,14]

There is a high prevalence of cutaneous changes reported in patients undergoing hemodialysis. Concordant with similar studies, at least one cutaneous manifestation had been found in 97% of the patients in this study. Xerosis was the most common finding in our study. It was present in 84% of the patients. The factors that probably contributed to xerosis included a reduction in size and functional abnormalities of eccrine sweat glands, high doses of diuretics, and alteration of Vitamin A metabolism. It is nearly compatible with other studies.^[1,3,16]

Pruritus was one of the most frustrating and disabling findings in these patients. It was perceived that pruritus usually affects 50%–90% of patients undergoing hemodialysis,^[3,15,16] and it can be of mild-to-moderate intensity in 64.84%, whereas of severe intensity in 5.15%^[14] of patients.

A resemblance percentage of pruritus have been noted in our patients. Sixty-three percent of the patients in this study suffering from a variable intensity of pruritus, extending from mild in 54%, moderate in 25% to severe in 21%. Sixty percent of those with pruritus got relief after hemodialysis, whereas in 32% of our patients, pruritus was not affected by hemodialysis. This figure is nearly similar to the findings of other studies.^[2,3]

Hyperpigmentation was manifested in 54.3% of patients in Mirza *et al.*'s study.^[14] This figure is slightly higher than the evidenced percentage of hyperpigmentation in our study (50%).

On the other hand, cutaneous infections have been observed in 14% of our patients, in opposed to the same study,^[14] in which cutaneous infections were prevalent in only 4.6% of the patients.



Figure 6: Perforating disease at the elbows in patient #1



Figure 7: Perforating disease at the lower legs in patient 2

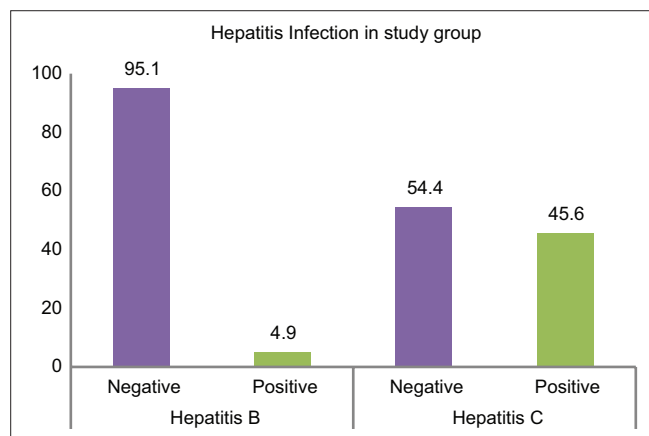


Figure 8: Prevalence of hepatitis B and hepatitis C in the study participants ($n = 103$)

Half-and-half nails or Lindsay nails have been observed in one-third of patients with ESRD,^[17] whereas this complication was only seen in 13% of the patients in this study.

Regarding ecchymosis, it was diagnosed in 21% of the participants of this study, analogous to other studies that showed nearly the same result.^[15-17]

Similarly, calciphylaxis was seen in 2%^[14] of patients in relevant studies, which is the same percentage that was obtained in our study.

SLE had been determined as the underlying cause of ESRD in 2% of our patients, which is compatible with other studies.^[1,2,4] Likewise, in this study, tuberous sclerosis was observed as an underlying cause in 1% of cases as in the other identical studies.^[1,3]

Furthermore, APD was a feature in 1.3% of patients of commensurate studies,^[14] for as much as 2% of the patients of this study.

Complications such as porphyria and pseudoporphyria were not seen in this study, whereas other researches noticed these complications in about 1.2%–9%^[3] of their patients.

Hepatitis C and B are highly prevalent in patients undergoing hemodialysis. Different centers around the globe registered diverse percentages. In this study, hepatitis C and hepatitis B were prevalent in 46% and 5% of the patients, respectively, whereas other studies elucidate a percentage of 5.9% for hepatitis C and 7% for hepatitis B.^[18]

CONCLUSIONS

There is a high prevalence of cutaneous changes in ESRD patients on hemodialysis. The most common finding reported was xerosis. Pruritus was the most frustrating symptom. Pigmentary disturbances were also observed. Hyperpigmentation was mainly diffuse. Other rare findings included nail changes, ecchymosis, calciphylaxis, and perforating disease.

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Conflicts of interest

There are no conflicts of interest.

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