

# Skin Changes among Patients with Chronic Kidney Disease on Predialysis and Maintenance Haemodialysis

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**Abstract:** *Chronic renal failure presents with various cutaneous manifestations. The aim of this study was to estimate the frequency and pattern of cutaneous manifestations among patients with chronic renal failure on regular haemodialysis and in predialysis. This is a prospective study of 198 patients with chronic kidney disease on haemodialysis (n=65) and in predialysis (n=133) were examined by a dermatologist to assess the skin, hair, nails, and mucous membranes. Of the 65 studied patients, 30 (46%) were women and 35 (54%) were men with a mean age of  $49.2 \pm 15.8$  years. The duration of hemodialysis was  $27.8 \pm 11.0$  months. Dermatologic examination revealed that 175 patients (88.4%) suffered from at least one type of skin problems, of whom 96.9% in dialysis group and 84.2% in pre dialysis. Cutaneous alterations are frequent in patients with chronic renal disease. All the patients should follow up regularly dermatological examination to reduce the morbidity.*

**Keywords:** chronic renal disease, dermatologic manifestations, hemodialysis

## 1. Introduction

Chronic renal failure often produces specific skin changes, which can develop long before failure manifests clinically. The skin is a mirror for many systemic diseases including renal diseases. These symptoms tend to alter and are aggravated relatively quickly when chronic renal insufficiency leads to compulsory dialysis treatment (1). There are many reports of cutaneous changes in chronic renal failure from different parts of the world. The effects of chronic kidney disease are complex as it causes dysfunction of multiple organs. The disease may be followed by different symptoms such as skin manifestations, and sometimes these symptoms may be the first important sign of the disease (2). In almost all patients with progressive kidney failure, at least one of the cutaneous involvements can be observed. Although many of the patients with end-stage renal disease can improve their quality of life by hemodialysis, prolonged hemodialysis itself will be associated with certain cutaneous and mucosal complications or changes in the type of dermatologic involvement and manifestations (3). The cutaneous manifestations of end-stage renal disease are divided into specific and nonspecific groups. The skin is the most visible and easily accessible organ of the body. For an cautious clinician, the skin may function as an important diagnostic window to disease affecting internal organ. This is especially true for the renal system. Chronic renal failure is a pathophysiologic process with multiple etiologies, resulting in the impaired function, and frequently leading to end stage renal disease which represent a clinical state or condition in which there has been an irreversible loss of the function, render the patients permanently dependent upon renal dialysis in

order to avoid life threatening uremia (4). Uremia is the clinical and laboratory syndrome, untreated acute or chronic renal failure. The skin is the largest body organ that shows remarkable functional and structural diversity. Chronic renal disease is defined as evidence of kidney damage over 3 months period with or without reduction of glomerular filtration rate revealed by clinical assessment, abnormal urinary finding, abnormal renal imaging, genetic disease or histologically proven disease (5). Chronic renal disease is associated with array of skin problems. More recently with advent of dialysis some of the skin lesions have become rare, but several other abnormalities of skin and the appendages have emerged. These dermatological diseases in most cases are not part of irreversible stigmata of chronic renal disease, rather they demand appropriate attention, proper diagnosis and in most cases treatment can be provided with symptomatic relieve of the patient (6). This study was done to find out frequency and pattern of dermatological disorders in chronic kidney disease patients on regular hemodialysis.

## 2. Materials and Methods

This is a prospective study. From February 2012 to September 2014, 198 patients with chronic kidney disease presenting at University Hospital Centre "Mother Theresa" in Tirana were included in the study. 65 patients were on regular haemodialysis while 133 were on pre dialysis stage on medication. Informed consent was obtained from all of the enrolled patients. Sociodemographic data of the patients, underlying cause of the disease, and duration of hemodialysis were collected. All patients were examined by a dermatologist

examined to assess the skin, hair, nails, and mucous membranes.

### 3. Results and Discussion

Of the 198 studied patients, 86 (43%) were women and 112 (57%) were men with a mean age of  $49.2 \pm 15.8$  years. The duration of hemodialysis was  $27.8 \pm 11.0$  months. None of the patients had a history of peritoneal dialysis. The most common causes of end stage renal disease in the patients were diabetes mellitus in 34.8%, hypertension in 29.2%, diabetes mellitus with hypertension in 4.8%, glomerulonephritis in 30.8% and unknown causes in 3.1%. It was found that 3.1% patients were infected with hepatitis C virus, 3.1% with hepatitis B virus, and 1.5% with both of the viruses. None of the patients were positive for human immunodeficiency virus. Dermatologic examination revealed that 175 patients (88.4%) suffered from at least 1 type of skin problems, of whom 96.9% in dialysis group and 84.2% in pre dialysis (table 1).

In patients on maintenance haemodialysis the frequency of Xerosis (56.9%), pruritus (47.7%) and pallor (23.1%) were higher as compared to patient on medication. With dialysis, the severity of pruritus had increased in 17 patients, had not altered in 12, and had decreased in 2 patients.

Hair, problems were present in 43 (66.2%) patients, nail disorders were present in 42 (64.6%) patients whereas oral mucosal disorders were present in 31 (47.7%) patients on maintenance haemodialysis (table 2). The most common hair disorders among patients with haemodialysis were alopecic foci (21.5%) sparse hair (16.9%) and lusterless hair (10.8%) while the most common oral mucosal problem were candidosis and macroglossia in 23.1% of patients respectively and koilonychia (27.7%), platonychia (18.5%) and Beau's line (16.9%) were the most common nail's disorders. Dermatological disorders in chronic renal disease are present in majority of patients with or without haemodialysis (7,8). In this study xerosis, pruritus and pallor were the most common skin changes, similar to others studies reports.

In present study Xerosis was the most common cutaneous abnormality observed mainly in patients who were on maintenance hemodialysis (56.9%) compared to patients in pre dialysis (48.9%). Pruritus, an irritating problem of our patients, is one of the most common cutaneous complaints in patients with chronic renal disease (9). In our study, 47.7% of patients on maintenance hemodialysis and 37.6% in pre dialysis had pruritus. Our study findings are in line with various reports in literature. Uremic pruritus can be localized or generalized (10, 11). The severity of pruritus is variable and most of the patients experience severe and recurrent pruritus that disturbs during sleep and daily activities. In our study, the severity of pruritus had increased in nearly half of the patients since dialysis had been started.

Sparse body hair and diffuse alopecia with dry lusterless hair have been reported in patients with chronic renal

disease. In our study, alopecic foci were observed in 21.5% and 11.3% of patients in dialysis and in pre dialysis. Also, sparse body hair were observed in 16.9% and 3.8% of patients in dialysis and in pre dialysis.

Koilonychia was the most common nail abnormality seen in this study and was seen in 27.7% and 9.8% of patients in dialysis and in pre dialysis.

Oral mucosal changes in present study were seen in 47.7% and 41% of patients in dialysis and in pre dialysis.

### 4. Conclusion

With wider availability of haemodialysis centers and improvement in haemodialysis machines, patients with chronic renal failure are surviving longer and exhibiting cutaneous complications of disease and haemodialysis. Some of these may be missed if not specifically thought. Sometimes, few patients with these cutaneous manifestations seek dermatologist's consultation before being diagnosed as chronic renal failure. Hence a dermatologist should undertake a detailed clinical examination and refer the patient to nephrologists to rule out or diagnose renal failure. The dermatological manifestations may cause significant distress to these patients. These manifestations should be actively looked for in all patients, as early diagnosis and management can reduce morbidity. All the patients should also follow up regularly in dermatological department along with nephrology unit. This support that skin is a complex organ and is mirror of internal disease as many systemic diseases including chronic renal failure can be diagnosed by their cutaneous manifestations. Furthermore large-scale studies needed to be carried out to establish strong correlation between cutaneous manifestations and chronic renal failure.

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**Table 1:** Frequency of cutaneous manifestations

<i>Manifestation</i>	<i>Dialysis (n=65)</i>		<i>Pre Dialysis (n=133)</i>	
	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>
Xerosis	37	56.9	65	48.9
Puritus	31	47.7	50	37.6
Pallor	15	23.1	15	11.3
Edema Pedis	13	20	5	3.8
Forunculus	9	13.8	5	3.8
Melasma	8	12.3	2	1.5
Postinflammatory Hyperpigmentation	5	7.7	2	1.5
Keratosis	4	6.2	5	3.8
Acne	4	6.2	5	3.8
Purpura	4	6.2	5	3.8
Tinea Cruris	2	3.1	2	1.5
Pyodermia	2	3.1	2	1.5
Interrtigo	2	3.1	25	18.8
Pityriasis Versicolor	1	1.5	5	3.8
Skin lesions	2	3.1	5	3.8
Scabies	1	1.5	10	7.5
Diabetic wound	1	1.5	10	7.5
Lentigo solaris	1	1.5	5	3.8
Idiopathic Guttate Hypomelanosis (IGH)	1	1.5	10	7.5
Normal	2	3.1	21	15.8

**Table 2:** The frequency of hair, nail and oral mucous disorders

Manifestation	Dialysis (n=65)		Pre Dialysis (n=133)	
	N	%	N	%
<b>Hair</b>				
Alopecic foci	14	21.5	15	11.3
Sparse hair	11	16.9	5	3.8
Lusterless hair	7	10.8	2	1.5
Hair loss	6	9.2	2	1.5
Hair fragility	5	7.7	5	3.8
Diffuse alopecia	2	3.1	15	11.3
Normal	22	33.8	89	67.0
<b>Nails</b>				
Koilonychia	18	27.7	13	9.8
Platonychia	12	18.5	20	15.0
Beau's line	11	16.9	5	3.8
Clubbing	5	7.7	5	3.8
Half / half	5	7.7	0	0.0
Yellow nail	3	4.6	10	7.5
Leuchonychia	2	3.1	1	0.8
Normal	23	35.4	90	68.0
<b>Mucous membranes</b>				
Candidosis	15	23.1	15	11.3
Macroglossia	15	23.1	30	22.6
Aphthous	5	7.7	5	3.8
Angular chilitis	2	3.1	5	3.8
Normal	34	52.3	78	59.0

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