Original Research Article

Nail and hair changes in chronic kidney disease patients

Jogendra Singh[1], Gangadhar[2*]

[1]Senior Resident, Department of Cardiology AIIMS, Bhuvaneshwar. Odisha, INDIA.
[2]Senior Resident, Raichur Institute of Medical Science. Raichur, Karnataka, INDIA.
Email: gangadharbuduga@gmail.com

Abstract

Background: Nail and hair changes occur in patients with uremia as well as in those undergoing dialysis. Early diagnosis and treatment is important to improve quality of life in CKD patients. **Aim:** To study nail and hair changes in chronic kidney disease patients. **Material and Methods:** A total of 100 patients with chronic kidney disease were studied for nail and hair changes. A thorough skin examination was done by dermatologist also and specific investigations such as skin biopsies, culture and sensitivity for bacterial infections, Gram's stain, potassium hydroxide mount, and fungal culture were performed wherever indicated. **Results:** Nail changes were found in 30 patients of CKD. The most common nail change being half and half nail (Lindsay nails) 12% patients. Hair changes were seen in 29 patients (29%), with the findings including sparse hair in 19 patients (19%). Nail and hair changes were predominantly found in stage 5D (18% and 11% respectively). **Conclusion:** The nail and hair changes were predominantly found in stage 5D. The most common nail change being half and half nail and most common hair change was sparse scalp hair. Recognizing and treating these manifestations can have multifactorial advantages in CKD patients.

Key Words: Chronic kidney disease, half and half nail, sparse hair.

[*]**Address for Correspondence:**
Dr Gangadhar, Senior Resident, Raichur Institute of Medical Science. Raichur, Karnataka, INDIA.
Email: gangadharbuduga@gmail.com

Received Date: 12/12/2019 Revised Date: 11/01/2020 Accepted Date: 06/02/2020
DOI: https://doi.org/10.26611/10211515

Access this article online	
Quick Response Code:	Website: www.medpulse.in
	Accessed Date: 14 July 2020

INTRODUCTION

Chronic kidney disease is a progressive loss of kidney function over a period of months or years through five stages.[1,2] The effects of chronic kidney disease are complex as it causes dysfunction of multiple organs. The skin, most visible and accessible organ of the body, may function as an important diagnostic window to the diseases affecting the internal organs including the renal system.Nail changes occur in patients with uremia as well as in those undergoing dialysis. Microscopic examination of hair in uremia shows hair in telogen phase. With scanning electron microscope, uremic hair shows irregular diameter, flattening and twisting of its shaft and mild cuticular abnormalities. Cutaneous manifestations are often neglected by the clinician and physician and do not invite proper attention. However, they are not only very disturbing to the patient but also have systemic effects. Recognizing and treating these cutaneous manifestations can have multifactorial advantages in CKD patients. This study was conducted to study the nail and hair changes in chronic kidney disease patients.

MATERIAL AND METHODS

A total of 100 patients with chronic kidney disease attending the Nephrology clinic, General Medicine out-patient clinic and wards were included in the study. Written informed consent for participation in the study was obtained from each patient. Chronic kidney disease was defined by KDOQI guidelines (kidney disease outcome quality initiative group rate). The CKD patients were classified based on the presence of kidney damage and level of kidney function (glomerular filtration rate [GFR]), irrespective of diagnosis, according to the KDOQI CKD classification.3 Staging of these patients were done according to the eGFR using MDRD (modification of diet in renal disease) formula. Patients with CKD stage V were further classified as either stable

CKD, hemodialysis-dependent CKD (D-CKD). Each patient was subjected to detailed history and examinations of past records, with special emphasis on records of hypertension, chronic kidney disease, diabetes mellitus and other comorbid conditions. A thorough clinical examination was done, especially dermatological examination.

Inclusion criteria

- Age >18 years of either sex
- eGFR< 60ml/min/1.73 sq. meter.
- CKD stage V (dialysis) - undergoing maintenance hemodialysis (MHD) for at least one month.

Exclusion criteria

- Known dermatological disorder i.e. collagen disorder, primary cutaneous disease etc.
- Known cases of malignant disease
- Patients with drug rashes
- Known HIV, Hepatitis B and C infection
- Pregnant and lactating female
- Patients of acute kidney injury
- Renal transplant recipients
- Patients of peritoneal dialysis

All the participants were subjected to investigations like complete haemogram, Kidney function test, Liver function test, HIV, Hepatitis B, Hepatitis C, Urine routine and microscopic examination, Electrocardiography and USG abdomen and KUB. Estimated GFR (eGFR) was calculated by using MDRD (modification of diet in renal formula). A thorough skin examination was done by dermatologist also and specific investigations such as skin biopsies, culture and sensitivity for bacterial infections, Gram's stain, potassium hydroxide mount, and fungal culture were performed wherever indicated.

Statistical analysis

The data was entered in MS EXCEL spreadsheet and analysis was done using Statistical Package for Social Sciences (SPSS) version 21.0. Categorical variables were presented in number and percentage (%) and continuous variables were presented as mean ± SD and median. Qualitative variables were correlated using Chi-Square test. A p value of <0.05 was considered statistically significant.

Ethical Committee approval was taken for present study.

a. White nail

b. Onychomycosis

c. Onycholysis

RESULTS

The mean age group of our study was 47.28 with a standard deviation of 14.94. The majority of patients (24%) belonged to age group of 36-44 years, followed by 20% in age group of 54-62 and 17% in age group of 45-53. 11% each were in the age group of 18-26 years and in the age group of 27-35 years. 10% and 7% patients belonged to age group of 63-71 years and >72 years respectively. Out of 100 patients; 20 patients of stage 3 (20%), 20 of stage 4 (20%), 20 of stage 5 (20%) and 40 of stage 5D (40%). Of the 100 patients taken for the study, the majority were males (61%), while 39 patients (39%) were females. Majority of patients i.e. 40 (40%) were diabetic, while hypertension was the second most common accounting for 34% of the cases. 13% were due to glomerulonephritis. 3% cases were due to polycystic disease and obstructive causes including renal calculi, BPH etc. The remaining causes or the unidentified causes contributed approximately 4% of our study population. Nail changes were found in 30 patients of CKD. The most common nail change being half and half nail (Lindsay nails). It was found in twelve patients of CKD (12%). The other nail changes were white nail, onychomycosis, and brown nail bed arc, Koilonychias in 5%, 4%, 4% and 2%. Other few changes seen were beau's lines, onycholysis and pitting nails. (Table 1).

Table 1: Nail changes in CKD patients

Nail changes	Frequency	Percentage
Half and Half nails	12	12.00%
White nail	5	5.00%
Brown nail bed arc	4	4.00%
Beau's line	1	1.00%
Onycholysis	1	1.00%
Onychomycosis	4	4.00%
Pitting nail	1	1.00%
Koilonychias	2	2.00%
Absent	70	70.00%
Total	**100**	**100.00%**

The nail changes were seen maximum in the age group of 54-62 (7%). While the maximum proportion was in the age group of >72 yrs. with changes seen in 5 out of 7 patients (71%).

Table 2: Distribution of nail changes in CKD patients according to age

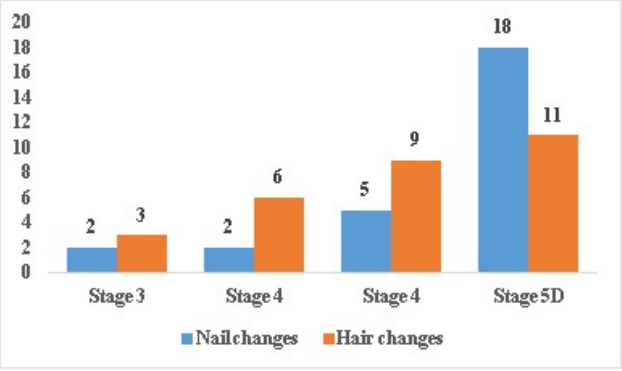
Age distribution	Nail change		Total	P value
	Absent	Present		
18-26	8 (11.43%)	3 (10%)	11 (11%)	0.210
27-35	7 (10%)	4 (13.33%)	11 (11%)	
36-44	19 (27.14%)	5 (16.67%)	24 (24%)	
45-53	14 (20%)	3 (10%)	17 (17%)	
54-62	13 (18.57%)	7 (23.33%)	20 (20%)	
63-71	7 (10%)	3 (10%)	10 (10%)	
72-80	2 (2.86%)	5 (16.67%)	7 (7%)	
Total	**70 (70%)**	**30 (30%)**	**100 (100%)**	

Hair changes were seen in 29 patients (29%), with the findings including sparse hair in 19 patients (19%) and lusterless hair in 10 patients (10%). The hair changes were seen maximum in the age group of 45-53 (24.14%).

Table 3: Distribution of hair changes in CKD patients according to age group

Age distribution	Hair change		Total	P value
	Absent	Present		
18-26	7 (9.86%)	4 (13.79%)	11 (11%)	0.405
27-35	6 (8.45%)	5 (17.24%)	11 (11%)	
36-44	21 (29.58%)	3 (10.34%)	24 (24%)	
45-53	13 (18.31%)	4 (13.79%)	17 (17%)	
54-62	13 (18.31%)	7 (24.14%)	20 (20%)	
63-71	7 (9.86%)	3 (10.34%)	10 (10%)	
72-80	4 (5.63%)	3 (10.34%)	7 (7%)	
Total	**71 (71%)**	**29 (29%)**	**100 (100%)**	

On further evaluating it was found that the nail changes were predominantly found in stage 5D (18% in stage 5D), 5% in stage 4 and stage 5 and 2% in stage 3. The hair changes are seen maximum in stage 5D in 11 patients (11%), 9 patients (9%) in stage 5, six (6%) and three (3%) in stage 4 and stage 3 respectively.



Graph 1: Nail and hair changes according to CKD stages

DISCUSSION

Chronic kidney disease is recognized as a significant worldwide public health problem in the world. Various small scale studies have been done to identify the skin lesions in CKD patients to establish its correlation with severity. Nail changes were present in 30 patients (30%). Of these maximum numbers of cases were due to half and half nails (12%), which is in accordance with study of Singh *et al* (13.3%).[4] Koilonychia was seen in two patients (2%), which is high compared to study of Thomas *et al* (5%).[5] The reason for this may be due to associated anaemia in the present study. Second most common nail finding was white nail seen in 5% patients. Nail changes seen in present study among dialysis group is similar to the studies of Udaykumar *et al*[6] and Sultan *et al*.[7] Koilonychias (2%) in present study was not in accordance with study of Udaykumar *et al* (18%).[6] Half and half nail is seen in 12% patients and less compared to studies of Udaykumar *et al* (21%)[6] and Sultan *et al* (28%).[7] In majority of patients, hairs were normal (71%). Only 19 patients (19%) had sparse scalp hair and 10 patients (10%) had lustreless hair. The numbers of patients having hair changes were more in present study compared to that of Falodun *et al* (2.5%).[8] The reason for this may be due to associated anaemia in the present group. Udaykumar *et al*[6] found sparse body hair (30%), sparse scalp hair (11%) and brittle and lusterless hair (16%) in his study. In study of Sultan *et al*[7] reported brittle and lusterless hair in (47%), sparse scalp hair (46%) and sparse body hair (27%). Hajheydari *et al*[9] noticed scalp alopecia in 9.9%, drying and hair fragility in 2% and hair discolouration in 2% of patients. Present study is in accordance with study of Udaykumar *et al*.[6] Hair changes are less compared to Sultan *et al* study.[7]

CONCLUSION

The nail and hair changes were predominantly found in stage 5D. The most common nail change being half and half nail and most common hair change was sparse scalp hair. Recognizing and treating these manifestations can have multifactorial advantages in CKD patients.

REFERENCES

1. Goddard J, Turner AN, Cumming AD, Stewart LH. Kidney and urinary tract disease. In: Boon NA, Colledge NR, Walker BR, Hunter JA, (eds). Davidson's Principles and Practice of Medicine, 20th edn. Edinburgh: Churchill Livingstone, Elsevier; 2006. p. 455-518.
2. Watnick S, Morrison G. Kidney. In: Tierney LM, McPhee SJ, Papadakis MA, (eds). Current Medical Diagnosis and Treatment, 43rd ed. New York: McGraw-Hill; 2004. p. 863.
3. Khanna D, Singal A, Kalra OP. Comparision of cutaneous manifestations in chronic kidney disease patients with or without dialysis. Postgrad Med J 2010;86:641-7.
4. Singh G, Verma AK, Singh G, Singh SJ. Cutaneous changes in chronic renal failure, Indian J Dermatol

Venereol and Leprol 1992; 58:320-322.
5. Thomas EA, Pawar B, Thomas A. A prospective study of cutaneous abnormalities with chronic kidney disease. Indian Journal of Nephrology 2012; 22(2):116-120.
6. Udaykumar P, Balasubramanian S, Ramlingam KS , Lakshmi C, Srinivas CR, Mathew AC. Cutaneous manifestations in patients with chronic renal failure on hemodialysis.Ind J Dermatol Venerol and Leprol 2006;72(2):119- 125.
7. Sultan MM, Mansour HH, Wahby IM, Houdery AS. Cutaneous manifestations in Egyptian Patients with Chronic Renal Failure on regular hemodialysis. J Egypt Women Dermatol Soc. 2010; 7:49-55.
8. Falodun O, Ogunbiyi A, Salako B,George AK. Skin changes in patients with Chronic Renal Failure .Saudi J Kidney Dis Transpl 2011; 22 (2):268-272
9. Hajheydari Z, Makhlough A. Cutaneous and mucosal manifestations in patients on maintenance hemodialysis: A study of 101 patients in Sari, Iran. Iran J Kid Dis 2008;2(2):86-90.

Source of Support: None Declared
Conflict of Interest: None Declared