Dermatological Manifestations in Patients of Chronic Kidney Disease (CKD)

Bansal Charu[1], Varshney Anshul[2]

[1]Assistant Professor, Department of Dermatology, Rama Medical College, Uttar Pradesh, India,
[2]Associate Professor, Department of Medicine, Rama Medical College, Uttar Pradesh, India

Abstract

Background: CKD is associated with various mucocutaneous manifestations that impair the quality of life. The objective was to study the incidence of various cutaneous manifestations in CKD patients.

Materials and Method: 130 (M:F = 4.2:1) patients aged 15–78 (Mean age- 50.32 years) having CKD for 3 month to 5 years were studied for mucocutaneous manifestations. Forty (30.7%) patients were on hemodialysis for 1-3 months. Detailed medical history, clinical and mucocutaneous examination and lab investigations were performed. KOH mounts, skin biopsy, Gram's and Giemsa staining, bacterial or fungal cultures were performed as required.

Results: Xerosis in 104 patients (80%), skin pallor in 76(58.4%), pruritus in 52 (50.9%) patients, pigmentation in 45(34.6%) and purpura in 12 (9.2%) patients were the major dermatoses. Perforating folliculitis occurred in1 (0.76%) patient..Mucosal findings included coated tongue in14(11.66%), xerostomia in 11(9.16%) and macroglossia with teeth markings and fissured tongue in 9 (7.5%) patients each, angular cheilitis in 3 (2.5%), and aphthous stomatitis and black pigmented tongue in 1 (0.83%) patients each. Hair abnormalities included sparse scalp and body hairs in 43 (33%), 11 (8.4%), respectively and lusterless hair in 22 (16.9%) patients. Major nail abnormalities were half and half nails or Linday's nails in 33(25.3%), longitudinal ridging in 29(22.3%), leuconychia in 13(10%), onycholysis in 9(6.9%), Beau's lines in 6(4.6%), koilonychias in 4(3.07%), Mee's lines in 1(0.76%) and Meuhrcke's lines in 1(0.76%).

Conclusions: Xerosis, pruritus, skin pallor/pigmentary changes, half and half nails, longitudinal ridging, discoloration, sparse hairs, coated tongue, xerostomia, macroglossia, and infections were the most common mucocutaneous manifestations in the studied patients irrespective of hemodialysis status.

Keywords: *Cutaneous manifestations, end-stage renal disease, skin diseases.*

Introduction

Chronic kidney disease (CKD) is a term that encompasses all degrees of decreased renal function, from damaged–at risk through mild, moderate and severe chronic kidney failure. The guidelines define CKD as either kidney damage or a decreased glomerular filtration rate (GFR) of less than 60 mL/min/1.73 m^2 for at least 3 months.(1) It is a worldwide public health problem. Studies report the prevalence of Chronic kidney disease (CKD) to be 17.3% in India.(2)

CKD is more prevalent in the elderly population. However, while younger patients with CKD typically experience progressive loss of kidney function, 30% of patients over 65 years of age with CKD have stable disease.(3) Most patients with severe CKD progress to end-stage renal disease (ESRD). Cutaneous manifestations are common in all stages of CKD

Corresponding Author:
Dr. Anshul Varshney
Associate Professor, Department of Medicine, Rama Medical College, Uttar Pradesh, India
e-mail: dranshulvarshney@gmail.com

particularly towards ESRD with a prevalence of 50–100%.[4,5] An earlier study by Uday Kumar et al 2 reported all patients with ESRD on hemodialysis to have atleast one skin manifestation.[6] The skin manifestations maybe due to the fact that at present dialysis is not as efficient as a normal kidney and cannot replace its endocrine function resulting in electrolyte imbalance and build-up of uremic substances. Some of the manifestations may be as a result of dialysis and immunosuppressive drugs used.[7] Skin manifestations specific to dialysis patients include acquired perforating dermatosis, calcific Uremicarteriolopathy (calciphylaxis), bullous lesions and nephrogenicfibrosing dermopathy. On the other hand, pruritus, xerosis, nail disorders, hair disorders, pigmentary changes, purpura, mucosal changes and pallorthough not specific to hemodialysis, are more frequent in patients with CKD. However, it may be difficult to implicate either CKD or hemodialysis alone for any particular cutaneous manifestation as many of them are associated with both.[8] The aim of the study was to analyse the various cutaneous and mucosalmanifestations in patients with CKD. We have limited studies on the pattern of mucocutaneous manifestations in CKD patients in India, so this study was carried out.

Materials and Method

A hospital based cross sectional study was conducted on 130 patients admitted in Rama Hospital for duration of 1 month after taking informed consent. The study was approved by ethical committee of the hospital. Patients with history of Human immunodeficiency (HIV), renal transplant recipients and patients with acute renal failure, hepatobiliary, pancreatic, or thyroid disorders, cutaneous, or systemic malignancies were excluded from the study. Details of medical history, clinical and mucocutaneous findings and investigations were recorded. KOH mounts, skin biopsy, Gram's and Giemsa staining and bacterial or fungal cultures were performed when needed. The diagnosis and clinical staging of CKD was as per the National Kidney Foundation severity assessment criteria.

Statistical Analysis: Statistical analysis was done using Chi-square test to find associations between various cutaneous manifestations. Biochemical values were expressed as mean. To explore relationship of cutaneous findings and biochemical parameters, the unpaired t test was used. A p value of less than 0.05 was considered significant.

Results and Discussion

Of the 130 patients, 105 were males and 25 were females (M:F=4.2:1). The age of patients ranged from 15-78 years with the mean age being 50.32 years having CKD for 3 months to 5 years.

Out of 130, 40(30.7%) patients were on hemodialysis for 1-3 months. Atleast one cutaneous manifestation was present in 98% of the patients recruited in the study. Diabetes mellitus (DM) was the most common cause (45%) of renal dysfunction followed by hypertension (HTN) in 35% cases and glomerulonephritis in 4% cases.

Xerosis was the most common cutaneous finding as reported in 104 patients (80%) with severe and ichthyotic in 10 (8.33%) patients irrespective of the dialysis status. This is consistent with the previous studies also.[9,10,11,12] It can be correlated with decreased sweating and lowered levels of lipids in the skin surface. The decreased sweating may be due to a decrease in the size of the eccrine duct.[5,6] The second most common finding after xerosis was pruritis as seen in 82(63%) patients. The pruritus intensity was mild to moderate in 52 (50.9%) patients with xerosis. It may be generalized or localized, episodic or continuous. It may or may not improve from hemodialysis and occurs in 15–49% during predialysis and in 19-90% hemodialysis patients.[5,6,10,13]. However, there was no significant difference among patients with or without hemodialysis. The pathogenesis of uremic pruritus is poorly understood but its intensity is directly proportional to the severity of xerosis[14]. In addition to pruritus, associated with xerosis is elastosis and premature skin wrinkling in 33-40% patients.[14,15,16] Only 4 (3.3%) patients showed early skin wrinkling in this study.

Skin hyperpigmentation is another common finding in patients especially with ESRD. In our study, 45(34.6%) CKD and 48% of the hemodialysis patients had hyperpigmentation which is consistent with previous studies also.[10,12] This may be attributed to the accumulation of Melanocyte Stimulating Hormone (MSH) due to failure of kidneys to excrete it. Extremities and photoexposed areas were more severely affected.

Pallor of the skin due to anemia was observed in 76(58.4%) patients and was significantly more common among patients on hemodialysis. The anemia may be due to anoxia and decreased erythropoiesis due to reduced erythropoietin secretion by the kidney.[17] Ecchymosis/purpura was seen in 12 (9.2%) patients

but said to improve after hemodialysis.[6,12,16] These are attributed to the increased vascular fragility and platelet dysfunction resulting from high blood urea levels or heparin use during dialysis. Perforating folliculitis of unclear pathophysiology is significantly common among diabetic CKD patients.[6] which was observed in only 1(0.76%) in our study.

Mucosal abnormalities occurred in 55 (42.3%) patients including coated tongue in 14 (11.66%), xerostomia in 11 (9.16%), macroglossia with teeth markings and fissured tongue in 9 (7.5%) patients each, angular cheilitis in 3 (2.5%), and aphthous stomatitis and black pigmented tongue in 1 (0.83%) patients each.

The consistent nail change characteristic of CKD with or without dialysis is Lindsay's "half-and-half nails," a band of discoloration over the distal nail plate from increased density of nail bed capillaries, with a reported prevalence of 17–76%.[6,18] In our study, half and half nails or Linday's nails was seen in 33(25.3%) cases and longitudinal ridging in 29(22.3 %) cases. Other findings were leuconychia in 13(10%), onycholysis in 9(6.9%), Beau's lines in 6(4.6%), koilonychias in 4(3.07%), Mee's lines in 1(0.76%) and Meuhrcke's lines in 1(0.76%)

Hair abnormalities were seen in 65 (54.1%) patients. The findings were sparse scalp and body hair and lusterless hair in 43 (33%), 11 (8.4%), and 22 (16.9%) patients, respectively consistent with previous studies.[11,12,18] The factors responsible for these changes are anemia, reduced sebum production and parathormone levels, stress of ESRD/dialysis or neglected hair.[6,15,16,18]

There is increased susceptibility for bacterial, fungal, and viral cutaneous infections in 28–70% of CKD patients due to reduced immunity.[5,15,19] In this study, fungal infections 22(16.9%) were more common than bacterial infections 15(11.5%) and viral infections 7(5.38%).

Gynaecomastia was seen in one patient of end stage renal disease in our study. Udaykumar et al reported gynecomastia in 1% of cases.[6]

There was no significant association between biochemical parameters and various cutaneous findings (p>.05). There was no significant association between duration of dialysis and cutaneous manifestations (p>.05).

Conclusion

Xerosis, pruritus, skin pallor/pigmentary changes, nail pallor, nail discoloration, sparse hairs, coated tongue, xerostomia and macroglossia and infections were the most common mucocutaneous manifestations in majority of studied patients irrespective of their hemodialysis status.

Ethical Clearance: Taken from Institutional Ethical committee

Source of Funding: Self

Conflict of Interest: Nil

References

1. Levey AS, Eckardt KU, Tsukamoto Y, Levin A, Coresh J, Rossert J, et al. Definition and classification of chronic kidney disease: A position statement from kidney disease: Improving global outcomes (KDIGO). Kidney Int 2005;67:2089-100.
2. Singh AK, Farag YM, Mittal BV, Subramanian KK, Reddy SR, Acharya VN, et al. Epidemiology and risk factors of chronic kidney disease in India-Results from the SEEK (Screening and Early Evaluation of Kidney Disease) study. BMC Nephrol. 2013;14:114.
3. O'Hare AM, Choi AI, Bertenthal D, Bacchetti P, Garg AX, Kaufman JS, et al. Age affects outcomes in chronic kidney disease. J Am SocNephrol. 2007 Oct. 18(10):2758-65. [Medline].
4. Nunley JR. Dermatological manifestations of renal disease. Available from: http//emedicine.medscape.com/article/1094846-overview. [Last accessed on 2014 Dec 12].
5. Pico MR, Lugo Somolinos A, Sanchez JL, Burgos Calderon R. Cutaneous alterations in patients with chronic renal failure. Int J Dermatol 1992;31:860-3.
6. Udayakumar P, Balasubramanian S, Ramalingam KS, Lakshmi C, Srinivas CR, Mathew AC. Cutaneous manifestations in patients with chronic renal failure (CRF) on hemodialysis. Indian J Dermatol Venereol Leprol. 2006;72:119-25
7. Banavasi S Girisha, Tonita M Noronha, Ashok Menon, Akshata C Alva. Cutaneous manifestations in patients with end stage renal disease on hemodialysis. International Journal of Contemporary Medical Research 2016;3 (5):1386-1388.

8. Abdelbaqi-Salhab M, Shalhub S, Morgan MB. A current review of the cutaneous manifestations of renal disease. J CutanPathol. 2003;30:527-38.
9. Hajheydari Z, Makhlough A. Cutaneous and mucosal manifestations in patients on maintenance hemodialysis: A study of 101 patients in Sari, Iran. Iran J Kidney Dis 2008;2:86-90.
10. Khanna D, Singal A, Kalra OP. Comparison of cutaneous manifestations in chronic kidney disease with or without dialysis. Postgrad Med J 2010;86:641-7.
11. Mirza R, Wahid Z, Talat H. Dermatologic manifestations in chronic renal failure patients on hemodialysis. J LiaquatUni Med Health Sci 2012;11:24-8.
12. Shah A, Hada R, Kayastha BM. Dermatological disorders in chronic kidney disease with and without maintenance hemodialysis. JNMA J Nepal Med Assoc 2013;52:365-71.
13. Akhyani M, Ganji MR, Samadi N, Khamesan B, Daneshpazhooh M. Pruritus in hemodialysis patients. BMC Dermatol 2005;5:7.
14. Szepietowski JC, Reich A, Schwartz RA. Uremicxerosis. Nephrol Dial Transplant 2004; 19: 2709-12.
15. Sanad EM, Sorour NE, Saudi WM, Elmasry AM. Prevalence of cutaneous manifestations in chronic renal failure patients on regular hemodialysis: A hospital based study. Egyptian J Dermatol Venereol 2014;34:27-35.
16. 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.
17. Goddard J, Turner AN, Cumming AD, Stewart LH. Kidney and urinary tract diseases. Davidsons principles and practice of medicine. 20th edition. Churchill Livingst-Elsevier. 2006;455-518.
18. Mourad B, Hegab D, Okasha K, Rizk S. Prospective study on prevalence of dermatological changes in patients under hemodialysis in hemodialysis units in Tanta University hospitals, Egypt. Clin Cosmet Investig Dermatol 2014;7:313-9.
19. Headley CM, Wall B. ESRD-associated cutaneous manifestations in a hemodialysis population. Nephrol Nurs J 2002;29:525-7.