



## CUTANEOUS MANIFESTATIONS IN PATIENTS WITH END STAGE RENAL DISEASE AND ON HEMODIALYSIS

Susmitha P<sup>1</sup>, Shalini K<sup>1</sup>, Rajendra Prasad P<sup>2</sup>, Achyuth P<sup>3</sup>, Venkatesh L<sup>1</sup>, Venkateshwarlu E<sup>1</sup>, KottaiMuthu A<sup>4</sup> and Sharavana bhava B.S.<sup>1\*</sup>

<sup>1</sup> Department of Clinical Pharmacy & Pharm.D., MGM Hospital, Vaagdevi College of Pharmacy, Hanamkonda, Warangal, Telangana, India

<sup>2</sup> Department of General Medicine, Kakatiya Medical College/ MGM Hospital, Warangal, Telangana, India

<sup>3</sup> Department of Clinical Pharmacy & Pharm.D., Vaagdevi Institute of Pharmaceutical Sciences, Bollikunta, Warangal, Telangana, India

<sup>4</sup> Associate Professor, Department of Pharmacy, FEAT, Annamalai University, Annamalai Nagar- 608002, Chidambaram, Tamil Nadu, India.

### ABSTRACT

The purpose of this study was to evaluate the prevalence of dermatologic problems among patients with End Stage Renal Disease undergoing Hemodialysis. Methods: It is a Multi-centric prospective Observational study, conducted in MGM hospital, Warangal and SVR Kidney and Dialysis centre, Hanamkonda. Results: Among the total subjects (n=243) enrolled in the study, the incidence of different skin alterations such as Hyperpigmentation, Pruritis, Xerosis etc., were recorded. Conclusion: All patients examined in study had atleast one or more Cutaneous lesions caused either by Disease or by treatment.

**Keywords:** End Stage Renal Disease, Hemodialysis, Hyperpigmentation, Pruritis, Xerosis.

### INTRODUCTION

End Stage Renal Disease is a worldwide public health concern with an incidence rate of 17.2%. The skin is external reflector of many renal diseases. A complex array of dermatologic lesions are presented among the patients with ESRD. These manifestations are due to the electrolyte imbalance, accumulation of uremic substances and presence of co-morbid conditions[1]. Early detection of these cutaneous alterations contributes in improving Quality of life among ESRD patients.

The pigmentation on sun exposed areas has been attributed to an increase in Melanin in the basal layer of the epidermis due to an increase poorly dialyzable beta melanocyte stimulating hormone. The intensity of Melanin pigmentation increases with respect to the duration of end stage renal disease[2]. High levels of urea in the blood allows accumulation of urea in the dermis, where it leeches into sweat glands and gets released onto the surface of the skin in a process described as “uridrosis” or “ruinous sweat”. Drying of the aqueous portion yields

the crystals of uremic frost[3]. The abundance of polymorphonuclear neutrophil remnants in the early stages of these disorders has led to speculation that cellular dissolution of neutrophils with proteolytic enzyme release, including collagenase and elastase elaboration, may initiate the pathologic process[4]. Koilonychia or spoon nails, in which the nails are abnormally thin and concave, from side to side, with edges turned up[5]. Patients with chronic renal failure (CRF) have impaired cellular immunity due to a decreased T lymphocyte cell count[6]. Xerostomia is a condition that reduce salivary flow resulting from atrophy and fibrosis of salivary glands[7]. Epidermolytic hyperkeratosis (EH) is a skin disease. The keratin filament clumping and degeneration terminally differentiating epidermal cells[8]. It occurs during the early stages of regular dialysis treatment and explained on the basis refeeding after starting treatment. As a consequence of CKD and protein energy malnutrition, pituitary gonadotropic and testicular function remain suppressed and increase in daily protein intake, second puberty ensues, which lead to transient gynecomastia[9]. Angular cheilitis (AC) is a condition characterized by erythema, most, ulceration and crusting at corners of the mouth[10]. Cutis increases the susceptibility to infections and this is aggravated by delayed wound

#### Address for correspondence:

**B.S.Sharvana bhava,**  
Department of Clinical Pharmacy &  
Pharm.D., Vaagdevi College of Pharmacy,  
Warangal, Telangana-506007

healing of the skin[11].Cutis increases the susceptibility to infections and this is aggravated by delayed wound healing of the skin[12].Hemorrhage (bleeding) into the surface of skin. In this increased vascular fragility, abnormal platelet function, and use of heparin during dialysis are the main cause of abnormal bleeding in these patients[13].It is a nail disease caused by dermatophytes, yeasts, and non dermatophytes [14].Mees lines also called as leukonychia striata , are white lines of discoloration across the nails of the fingers and toes. Transverse white lines of the lines with different etiologies, including chemotherapy, paraquat poisoning or systemic disease such as renal failure[15].It represents a relatively uncommon intra oral complication, mostly seen in ESRD patients[16]. Macroglossia is defined as a enlargement of tongue [17].Diffuse alopecia with dry, lusterless hair, which could be due to decreased secretion of sebum[18].

CKD patients Kidneys aren't removing urea from body. Body will find other ways to remove it. One of those ways is to push the excess urea out through your breath (19).

Itching associated with renal failure can be extremely severe, distressing and difficult to treat.It can also be distinguishing as a result of over enthusiastic scratching (20).

Acroangiokeratosis, also known as pseudo-kaposi's sarcoma is a reactive angiodyplasia of cutaneous blood vessels seen in association chronic venous insufficiency, arteriovenous malformation of the legs, chronic renal failure treated with dialysis(21).

We undertook the present study to determine the incidence rate of cutaneous alterations among ESRD patients.

## **MATERIALS AND METHODS**

It is a Multi-centric prospective Observational study, was conducted in MGM Hospital, Warangal and SVR Hospital & Dialysis centre , Hanamkonda.The prevalence of cutaneous manifestations in patients

with End Stage Renal Disease undergoing hemodialysis were evaluated based on parameters. Patients were explained about the study and informed consent forms were signed by explaining them in their local language. The Study Protocol, Data Collection Sheet and Informed Consent Forms were submitted and got approved from the Institutional Human Ethics Committee.

## **STUDY CRITERIA**

### **Inclusion Criteria:**

1.Patients with End Stage Renal Disease undergoing hemodialysis were included.

### **Exclusion Criteria:**

1.Patients undergoing hemodialysis following a Renal transplant failure, peritoneal dialysis or acute renal failure.

2.Patients diagnosed with auto-immune disorders such as psoriasis, SLE before undergoing dialysis were excluded.

## **RESULTS AND DISCUSSION**

A total of 243 patients were enrolled in this work, among these subjects (44.8%) 109 members presented Hyper pigmentation, (80.2%) 195 members shown Pruritis,(0.41%) 1 member indicated Uremic frost, (7.81%) 19 members presented Kyrle's disease, (17.2%) 42 members manifested with Koilonychia, (9.4%) 23 members evidenced Fungal/bacterial/viral infections, (13.5%) 33 members indicated Xerostomia, (0.823%) 2 members presented Gynecomastia, (11.5%) 28 members disclosed Angular cheilitis, (6.58%) 16 members displayed Onychomycosis, (42.79%) 104 members manifested Mee's lines, (4.52%) 11 members presented Ulcerative stomatitis, (2.46%) 6 members exhibited Macroglossia, (21.8%) 53 members displayed Sparse body hair, (11.11%) 27 members evidenced Uremic breathe, (33%) 82 members complained Xerosis, (31.27) 76 members were pallor, (23.04%) 56 members displayed Purpura and (0%) no members manifested Hyperkeratosis and PsuedoKaposi's sarcoma.

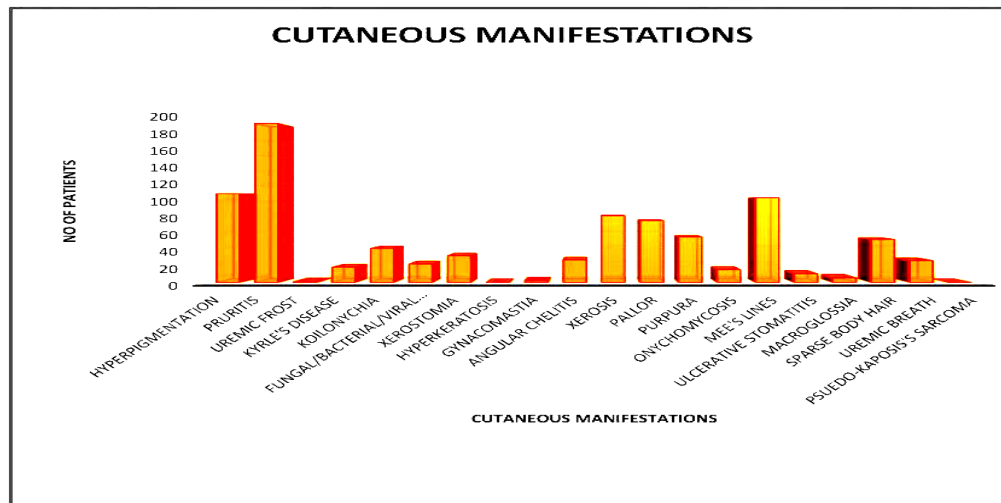


**Table-1 : Gender Distribution**

S.NO.	GENDER	NO.OF SUBJECTS	PERCENTAGE
1	Male	156	64.197%
2	Female	87	35.80%

**Table-2: Age distribution**

S.NO.	AGE[YEARS]	NO.OF SUBJECTS	PERCENTAGE
1	16-25	4	1.64%
2	26-35	26	10.69%
3	36-45	88	36.21%
4	46-55	88	36.21%
5	56-65	34	13.99%
6	66-75	3	1.234%



**Figure-1: Prevalence of Cutaneous manifestations in this research work**

### CONCLUSION

From the 243 patients included in this study, everyone has reported atleast one or more cutaneous manifestations during their Hemodialysis. It is important to evaluate and improve the quality of life of patients from their manifestations. With the advent of hemodialysis, the life expectancy of these patients has increased, giving time for more and newer changes to manifest. Some prophylactic and remedial measures can prevent or decrease some of

the adverse changes. These include emollients for Xerosis. Sunscreens, Sun avoidance measures and clothing for pigmentary changes and cutaneous malignancies. Oral hygiene to prevent oral mucosal changes, nutritional supplementation to prevent Angular cheilitis and Hair loss.

Further research must be focused on the relationship and therapy of these cutaneous manifestations in patients with End Stage Renal Disease and on Hemodialysis

### Acknowledgement

Authors are thankful to the Principal, Dr.C.Srinivas Reddy & Secretary, Dr.Ch.Devender Reddy for giving us opportunity to work and providing necessary facilities to carry out this Research work.

### Competing Interests

The Authors declare that they have no competing interests.

### Authors Contribution

Susmitha P and Shalini K may be considered as first authors and worked in the Hospital in collection of data, Counselling the patients undergoing Dialysis, etc., Achyuth P and Venkatesh L designed the documents required for the work, Dr.P.Rajendra Prasad was helpful as Clinical guide in selection of Patients, making them understand about the research work and treatment, E.Venkateshwarlu dragged the results by applying suitable statistical designs, Kottai Muthu A and Sharavana bhava B.S. discussed and conceived the idea of doing this research work and prepared the Project proposal.

### REFERENCES

- [1] Cecil RL, Goldman L, Schafer AI. Goldman's Cecil Medicine, Expert Consult Premium Edition--Enhanced Online Features and Print, Single Volume, 24: Goldman's Cecil Medicine. Elsevier Health Sciences; 2012.
- [2] Picó MR, Iugo-Somolinos AÍ, Sánchez JL, Burgos-Caldfrón RA. Cutaneous alterations in patients with chronic renal failure. International journal of dermatology. 1992 Dec;31(12):860-3.
- [3] Aich T. Uremic frost-A rare skin manifestation of severe kidney disease. The Journal of Medical Research. 2019;5(6):208-9.
- [4] Nair PA, Jivani NB, Diwan NG. Kyrle's disease in a patient of diabetes mellitus and chronic renal failure on dialysis. Journal of

- family medicine and primary care. 2015 Apr;4(2):284.
- [5] Randy Darrel Bumpers, Marvin Edwin bishop archives of dermatology 11[7],845-845,1980.
- [6] Picó MR, Lugo-Somolinos A, Sánchez JL. Cutaneous Alterations In Patients With Chronic Renal Failure. *International Journal of Dermatology*. 1992;31(12):860–3.
- [7] Bots CP, Brand HS, Veerman EC, Valentijn-Benz M, Van Amerongen BM, Valentijn RM, Vos PF, Bijlsma JA, Bezemer PD, Ter Wee PM, Amerongen AV. Interdialytic weight gain in patients on hemodialysis is associated with dry mouth and thirst. *Kidney international*. 2004 Oct 1;66(4):1662-8.
- [8] Cheng J, Syder AJ, Yu QC, Letal A, Paller AS, Fuchs E. The genetic basis of epidermolytic hyperkeratosis: a disorder of differentiation-specific epidermal keratin genes. *Cell*. 1992 Sep 4;70(5):811-9.
- [9] Braunstein GD. Gynecomastia. *New England Journal of Medicine*. 1993 Feb 18;328(7):490-5.
- [10] Park KK, Brodell RT, Helms SE. Angular cheilitis, part 1: local etiologies. *Cutis*. 2011 Jun 1;87(6):289-95.
- [11] Altmeyer P, Kachel HG, Jünger M, Koch KM, Holzmann H. Skin changes in long-term dialysis patients. clinical study. *Der Hautarzt; Zeitschrift für Dermatologie, Venerologie, und verwandte Gebiete*. 1982 Jun 1;33(6):303-9.
- [12] RM WK. Systemic disease and the skin. Champion RH, Burton JL, Burns DA, Breathnach SM, editors. *Rook/Wilkinson/Ebling Textbook of dermatology*. 6th ed. Blackwell Science: Oxford. 1998:2703-58.
- [13] Remuzzi G. Bleeding in renal failure. *The Lancet*. 1988 May 28;331(8596):1205-8.
- [14] Kaur R, Kashyap B, Bhalla P. Onychomycosis-epidemiology, diagnosis and management. *Indian Journal of Medical Microbiology*. 2008 Apr 1;26(2):108.
- [15] Huang TC, Chao TY. Mees lines and Beau lines after chemotherapy. *Cmaj*. 2010 Feb 23;182(3):E149-.
- [16] Jaremko WM, Beutner EH, Kumar V, Kipping H, Condry P, Zeid MY, Kauffman CL, Tatakis DN, Chorzelski TP. Chronic ulcerative stomatitis associated with a specific immunologic marker. *Journal of the American Academy of Dermatology*. 1990 Feb 1;22(2):215-20.
- [17] Murthy, P., and M.R. Laing. "Macroglossia: management depends on the cause; many patients will need long term psychological support." *British Medical Journal*, vol. 309, no. 6966, 26 Nov. 1994, p. 1386+
- [18] Morton CA, Lafferty M, Hau C, Henderson I, Jones M, Lowe JG. Pruritus and skin hydration during dialysis. *Nephrology Dialysis Transplantation*. 1996 Oct 1;11(10):2031-6.
- [19] Schreiner GE, Maher JF. Uremia: Biochemistry, pathogenesis and treatment. *Academic Medicine*. 1962 Apr 1;37(4):408..
- [20] Mehta AA, Pereira RR, Nayak CS, Dhurat RS. Acroangiokeratosis of mali: A rare vascular phenomenon. *Indian Journal of Dermatology, Venereology, and Leprology*. 2010 Sep 1;76(5):553.
- [21] Prasad PV, Bikku B, Kaviarasan PK, Senthilnathan A. A clinical study of psoriatic arthropathy. *Indian Journal of Dermatology, Venereology, and Leprology*. 2007 May 1;73(3):166.