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Epidemiological Study of Cutaneous Manifestations in Patients with Chronic Kidney Disease

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ABSTRACT
Background: *Chronic kidney disease (CKD) is associated with a varied cutaneous manifestations both due to its underlying etiology as well as treatment modalities.*
We evaluated the prevalence of dermatological manifestations in patients with CKD .
Material and methods: *In accordance with internal guidelines of the institute and approval by the Institutional Review Board of the hospital, a observational study was done on all the patients with CKD not on hemodialysis and not of post renal transplant, attending the dermatology OPD after taking informed consent. 106 patients with CKD, were examined for cutaneous changes. Among them were 68 males and 38 females with CKD*
Results: *The most prevalent finding in CKD patients was xerosis (69%) followed by pruritus (67%) and pigmentation disorders (11%). Other cutaneous manifestations included acquired perforating diseases(APD) (7.5%); fungal (9.4%), viral (7%) and bacterial (2%) infections and nail changes(11%).Other skin manifestations include in 25 (24%) patients and included eczemas in 14 (56%) stasis dermatitis in 4 (16%), ecchymosis in 3 (12%), acne 1 (4%), psoriasis 1 (4%), parasitic infections like scabies in 1 (4%) patients.Hair changes were seen in (18%),mucosal changes were seen in (14%)*
Conclusion: *In our study xerosis and pruritus were higher among skin changes. The dermatologic complications can significantly impair the quality of life in certain individuals; therefore, earlier diagnosis and treatment is important to improve their quality of life.*
Keywords- *Chronic kidney disease, Cutaneous Manifestations.*

Introduction

Chronic kidney disease is a patho physiologic condition that results in the decrease of qualitative and quantitative activities of the nephrons subsequently leading to end stage renal disease [ESRD] [1]. The different stages of chronic kidney disease form a continuum in time, and graded into five stages based on GFR according to the K/DOQI classification [2].

Review of the 2007 report revealed diabetes mellitus is responsible for close to 50% of new cases of ESRD. Hypertension and cystic/hereditary kidney diseases were the next most common causes. Glomerulonephritis, responsible for over 40% of cases in 1980, was responsible for less than 20% of all cases.[3]

The number of patients with end –stage renal disease in India is increasing with an estimated

annual incidence of about 100 per million populations.[4]

Nitrogenous by products of protein catabolism represented as urea and otherwise known as blood urea nitrogen commonly accumulate within the serum of these patients due to inadequate renal excretion which manifest as dysfunction of all organ systems[5]. The skin is amongst the most commonly affected systems. Most skin changes occur in the setting of uremia secondary to chronic kidney disease [1].

Cutaneous signs of renal failure are mainly related to chronicity of disease[6]. About 50-100% of patients with chronic kidney disease have atleast one cutaneous finding. We evaluated the prevalence of dermatological manifestations in patients of chronic kidney disease in our center, and also correlated few manifestations with respect to the stage of chronic kidney disease.

Materials and Methods

The research was conducted in full compliance with ethical principles.

In accordance with internal guidelines of the institute a descriptive study was done on all the patients with chronic kidney disease patients after taking informed consent.

Patients of all age groups and gender, irrespective of the cause and duration of chronic kidney disease were included .Patients of CKD on hemodialysis and on chronic ambulatory peritoneal dialysis (CAPD) were excluded and none of them had undergone renal transplant.

Complete dermatologic history was obtained and diagnosis of the dermatological manifestations was made on the basis of clinical features and thorough skin examination. Clinical photographs were taken for record. Specific investigations like skin biopsy and histopathological examination was performed whenever necessary. Required laboratory studies e.g. KOH mount, grams stain, fungal culture, culture and sensitivity for bacterial infections were done after written informed consent.

In addition to dermatological examination, a standardized questionnaire was administered to all patients to obtain a detailed personal history, including information on age, occupation, cause of renal failure, duration of chronic kidney disease, duration of skin change and onset of changes in relation to the duration of chronic kidney disease. Information of past medical history of all patients that was recorded in their medical documents about hypertension and diabetes mellitus also considered in this study.

Xerosis and pruritis were assessed based on the scoring system by EEMCO and VAS respectively, as written hereunder

All definitions and clinical criteria for diagnosis were applied according to the literature available and as mentioned in the standard textbook of dermatology.

Definitions

CKD- Chronic kidney disease is defined as either kidney damage or a decreased kidney glomerular filtration rate (GFR) of less than 60 mL/min/1.73 m2 for 3 or more months [3].

Table. 1 CKD Stages - KDOQI 2002

CKD Stage	GFR ml / min /1.73 m2
I	≥ 90
II	60-89
III	30-59
IV	15-29
V	<15

Xerosis refers to the dry or roughened skin texture frequently seen in dialysis patients.

In this study xerosis was assessed by EEMCO guidance for the assessment of dry skin (xerosis), Skin Research and Technology.[7]

Xerosis – Overall dry skin score (ODS)

0 – Absent

1 – Faint scaling, roughness, and dull appearance

2 – Small scales in combination with few large scales, slight roughness, whitish appearance

3 – Small and large scales uniformly distributed. Definite roughness, possibly slight redness and few superficial cracks.

4- Dominated by large scales, advanced roughness, redness present eczematous changes and cracks.

Pruritus defined as an unrestricted and uncomfortable sensation that elicits the desire to scratch. Patients were excluded if they had a prolonged pruritus caused by an additional disease.

A VAS (Visual Analogue Scale) was used to subjectively measure the severity of itching, based on the VAS score, patients were divided into three groups.

Mild - (0-5)

Moderate - (6-10)

Severe - (> 10)

Pruritus – Severity

1 - Slight itching sensation without need to scratch

2 - Need to scratch but without excoriations

3 - Scratching with excoriations

4 - Pruritus with overwhelming restlessness

Distribution

1. Itching at less than 2 locations
2. Itching at more than 2 locations
3. Generalised itching

Sleep Disturbance

1. Each scratching episode during night leading to excoriation
2. Each episode of awakening because of itching

Statistical Analysis

All data was entered in Microsoft Excel spread sheet. Categorical data was described as actual numbers and percentages. The prevalence rates of different dermatologic manifestations in chronic kidney disease patients, were calculated using the statistical package SPSS for windows version 10.0.

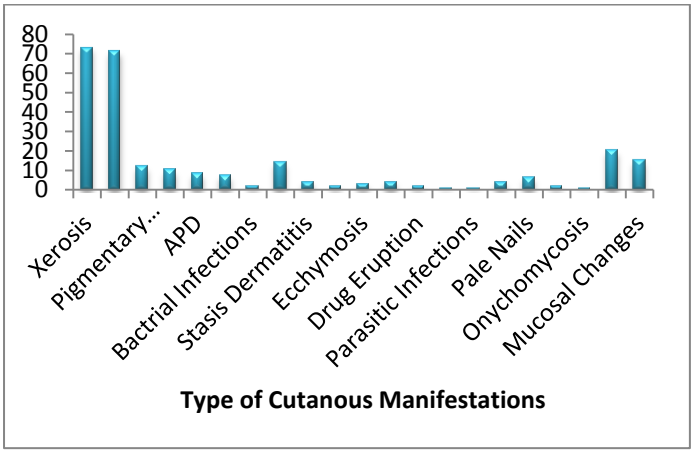

Fig. 1 Cutaneous Manifestations in CKD patients

Table. No 2 Various Cutaneous Manifestations in CKD Patients

Cutaneous Manifestations	Total N = 106	HTN N = 30	DM N = 3	HTN + DM = 53	%
Xerosis	73	19	1	41	68.9
Pruritus	71	20	1	38	67.0
Pigmentary Disorders	12	4	0	7	11.3
Fungel Infections	10	2	0	5	9.4
APD	8	2	0	6	7.5
Viral Infections	7	1	1	1	6.6
Bactrial Infections	2	0	0	2	1.9
Eczema	14	1	0	5	13.2
Stasis Dermatitis	4	1	0	4	3.8
Psoriasis	2	0	1	3	1.9
Ecchymosis	3	2	0	1	2.8
Contact Dermatitis	4	1	0	2	3.8
Drug Eruption	2	0	0	0	1.9
Acne	1	0	0	0	0.9
Parasitic Infections	1	0	0	0	0.9
Nail Changes					
Half and Half Nails	4	1	0	3	3.8
Pale Nails	6	2	0	3	5.7
Beau's Lines	2	2	0	0	1.9
Onychomycosis	1	0	0	0	0.9
Hair and Mucosal Changes					
Hair Changes	20	10	2	11	18.9
Mucosal Changes	15	8	0	9	14.2

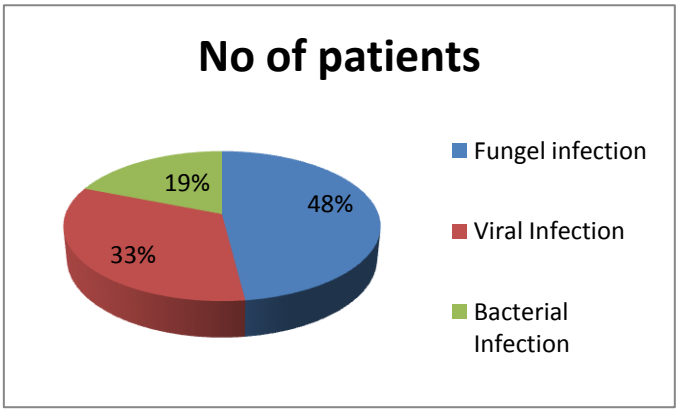

Fig. 2 Types of Infection

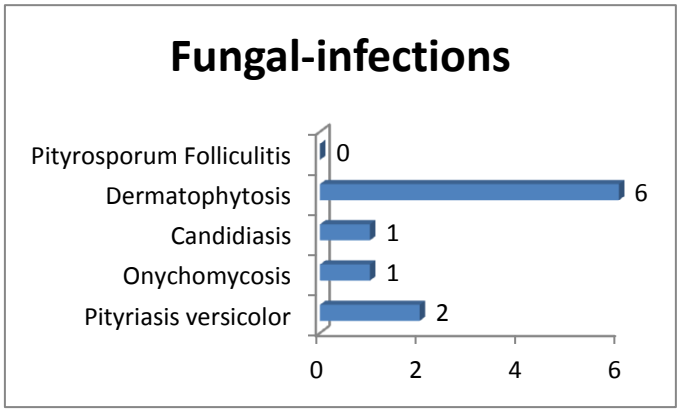

Fig. 3 Types of Fungal Infections

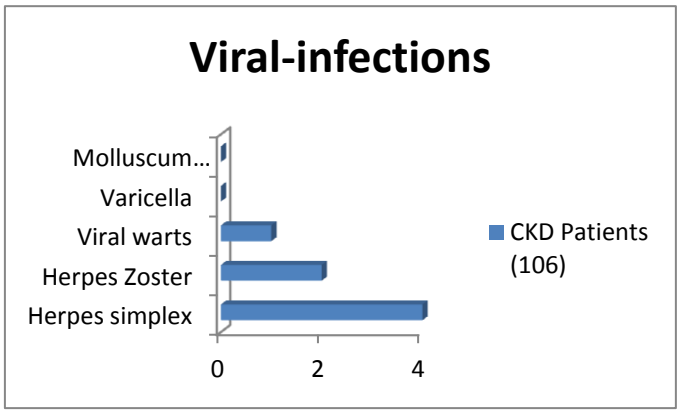

Fig. 4 Types of Viral Infections

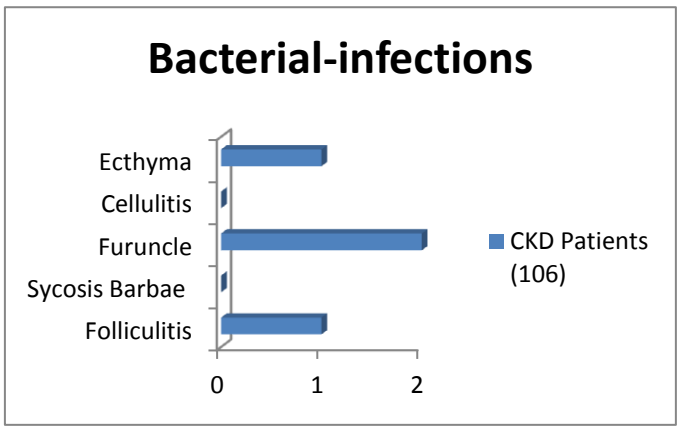

Fig .5 Types of Bacterial Infections

Table. No 3 Correlation of Xerosis Score with CKD Stages

Xerosis Score	CKD Stages				
	I	II	III	IV	V
0	10	10	8	2	3
1	7	19	14	11	3
2	3	6	2	2	0
3	1	1	1	0	1
4	0	1	1	0	0

Table. no 4 Correlation of Intensity of Pruritus with the CKD Stages

Pruritus Score	CKD Stages					Total
	I	II	III	IV	V	
Mild (0-5)	11	19	9	8	1	48
Moderate (6-10)	1	5	7	3	2	18
Severe (>10)	0	1	2	1	1	5

Results

Chronic renal failure presents with an array of cutaneous manifestations. Our study population consisted of 106 chronic kidney disease patients. The ages ranged from5 yrs to 94 yrs with the mean of 54.08 years in the CKD group.

There were 68 males and 38 females in the CKD group. There were diversity of primary diagnoses including parenchymatous diseases and obstructive uropathies.

Hypertension was seen in 79% of CKD patients. Diabetes mellitus was seen 53% of CKD patients. CKD patients were also separated into five groups according to there CKD stage.

Amongst the dermatological manifestations xerosis was present in 69% of patients followed by pruritus (67%), pigmentary disorders 11%,perforating disorders 7.5%,fungal infections 9.4%, viral infections 7%,bacterial infections2%,nail changes %, hair changes %, mucosal changes % and miscellaneous changes as shown in fig 1.

The distribution of fungal, viral and bacterial infections is depicted in fig no 2,3 and 4 respectively.

Xerosis in CKD patients was assessed by by EEMCO guidance for the assessment of dry skin (xerosis), Skin Research and Technology.[7]

score and mild xerosis was seen in 73% patients

Pruritus was assessed by scale and VAS (Visual Analogue Scale) and mild pruritus was present in 68% patients.

Nail changes were observed in11 % patients and the various changes are depicted in the table no 2

Hair and oral mucosal changes were seen in 18% and 14% patients respectively

Discussion

In our study xerosis was the most common dermatological manifestation in chronic kidney disease patients seen in 73(69%) patients [fig 6]. Similar observation was seen in previous studies [8,9,10]

Xerosis may be due to functional abnormality of the eccrine sweat glands leading to epithelial dehydration

Pruritus was the next common manifestation and presented in 71(67%) patients with maximum patients having mild pruritus 48(68%),18(17%) with moderate pruritus and 5(5%)with severe pruritus.

These findings were consistent with the figures quoted by Stahle –Backdahlet al [8]

In our study an attempt was made to correlate the intensity of pruritus with the chronic kidney disease stages, with mild pruritus present more in CKD stages I,II,III(81%).moderate pruritus was more (67%) in CKD stages II and III. while severe pruritus had no consistent relation with the CKD stage. the pruritus may be due to changes related to xerosis and hormonal derangement (hypervitaminosis A, retention of middle molecules.

In our study cutaneous infections were found in 19 (18%) patients. With fungal infections being the most common seen in 10 (9%), while viral infections in 7 (7%) and bacterial infections 2 (2%) distributed among total 106 chronic kidney disease patients. Amongst the fungal infections the most common was dermatophytic infection seen in 6 (60%) [fig 8]followed by pityriasis versicolor 2 (11%), and onychomycosis and candidiasis in 1 (5%) respectively distributed in 19 patients. Viral infections were distributed in 7 (7%) patients and included herpes simplex in 4 (4%) and herpes zoster in 2 (2%) [fig9] Bacterial infections consisted of folliculitis, carbuncle, ecthyma and cellulitis in 1% each. These infections can be explained as a result of impaired immunity (decreased B cell and T cell subset and activities).

In our study we found pigmentary disorders in the form of diffuse hyperpigmentation accentuated in the sun exposed areas in 12 (11%) patients,[fig10] which was lower as compared to that reported by Singh Gurucharan et al [11]. Singh Gurucharan et al reported diffuse hyperpigmentation accentuated in sun exposed areas in 36% of uremic patient11. The pigmentary changes may be due to hemosiderin deposition.

In our study miscellaneous conditions were observed in 25 (24%) patients and included eczemas in 14 (56%) stasis dermatitis in 4 (16%), ecchymosis in 3 (12%), acne 1 (4%), psoriasis 1 (4%), parasitic infections like scabies in 1 (4%) patients. While bullous pemphigoid, pellagroid dermatitis, non healing ulcer, adverse drug reaction were seen in 1 patient each. None of the CKD patients had features of nephrogenic fibrosing dermopathy and calcific uremic arteriolopathy.

Singh Gurcharan et al11 reported pallor as the most common nail change followed by half and half and Beau's line. In our study nail changes were found in 12 [11%] patients. The most common change was pallor of nails seen in 6 [50%], half and half nail in 4 [33%] [fig11]and beaus lines in 2[16%] patients, similar to that reported by Singh Gurcharan et al11. Acquired perforating dermatosis was found in 8 (7.5%) patients in our study.

Hair changes were seen in 20(18%) , included sparse scalp and body hair, lusterless, brittle hair, hair discolouration, dryness of hair. dryness was possibly due to decreased sebum secretion. Similar findings were reported by E A Thomas et al[12]

Oral mucosal changes were seen in 15(14%) which were in the form of macroglossia xerostomia, ulcerative stomatitis, angular cheilitis, uremic breath similar to those reported in previous studies[12]

Possible causes include dehydration, mouth breathing, high concentration of urea and failure to breakdown into ammonia.

Conclusion

In our study we observed different types of cutaneous manifestations in. chronic kidney disease patients. Xerosis and pruritus were the most common findings in CKD. Xerosis and pruritus were more prevalent in the CKD cases of stages II and III.

Followed by pigmentary disorders in the form of diffuse hyperpigmentation with accentuation in the sun exposed areas, perforating dermatosis,fungal viral and bacterial infections in that order of frequency.

Skin disorders in patient's with CKD can seriously affect the patients physical and mental health, thereby compromising their quality of life. Some prophylactic and remedial measures at an early stage can prevent or decrease some of the adverse cutaneous effects. These include frequent application of emollients for xerosis in the early stages thereby preventing pruritus thereby preventing infections. Frequent application of sunscreens, sun avoidance measures and proper clothing to prevent pigmentary changes. Prompt early recognition and treatment of fungal, viral and bacterial infections can help in preventing serious invasive infections. Dermatologist should also be aware of the importance of careful monitoring of cutaneous changes in the CKD for early diagnosis and treatment.

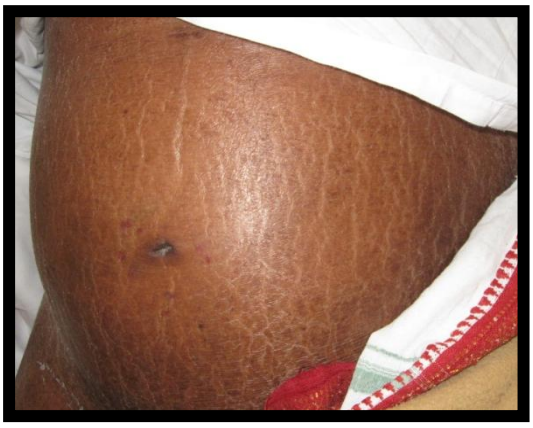

Figure 6. Xerosis

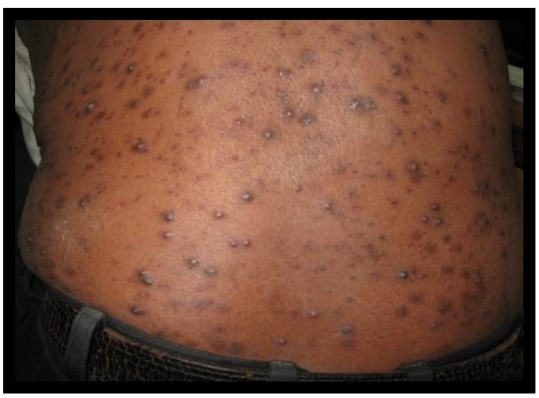

Figure 7. Acquired Perforating Dermatosis

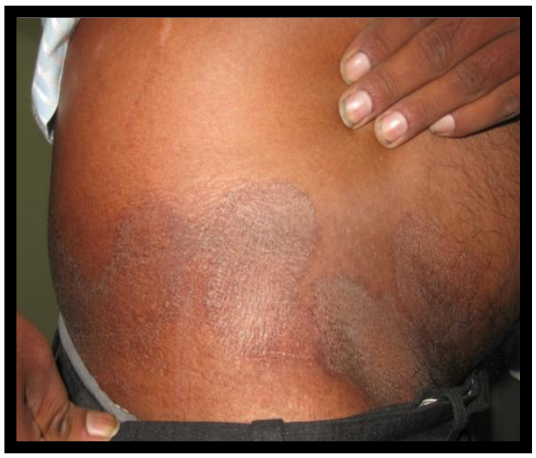

Figure 8. Tinea Corporis with Cruris

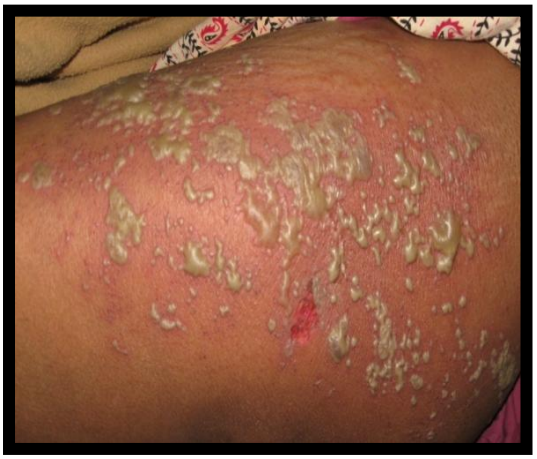

Figure 9. Herpes Zoster

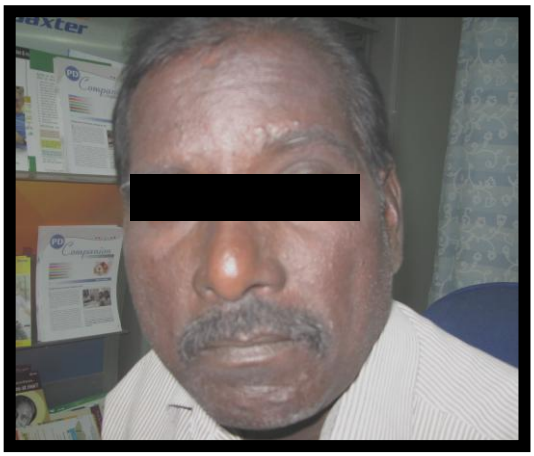

Figure 10. Hyperpigmentation of the Face

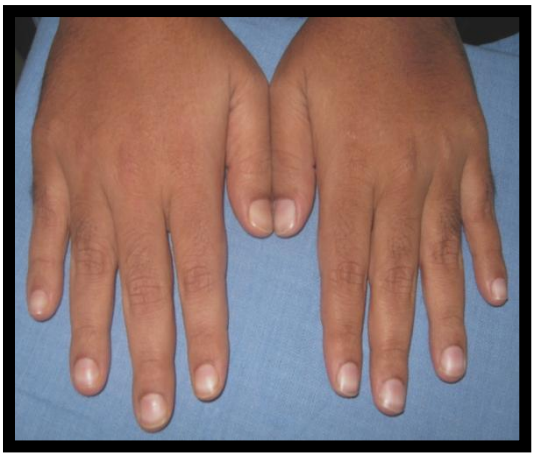

Figure 11. Half and Half Nails

Numerous factors influence the prevalence rate of the cutaneous manifestations and their diagnosis. The difference between our findings and the other similar studies on some specific cutaneous manifestations may be due to differences of race, socio-economic conditions and differences of climatic conditions. The observations of our study need further similar studies in a larger prospective controlled population for more accurate determination of the prevalence of the cutaneous manifestations in CKD.

AcknowledgEment

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References

1. E. A. Thomas, B. Pawar and A. Thomas., "A prospective study of cutaneous abnormalities in patients with chronic kidney disease," Indian Journal of Nephrology, 22(2):116–120, Mar-Apr 2012
2. Gilcherest BA, Rowe JW, Mihm M C., "Clinical & Histological skin changes in chronic renal failure. Evidence for a dialysis resistant, transplant responsive microangiopathy," Lancet, 2:1271-5, 1980.
3. Julia R.Nunley et al, "Dermatologic manifestations of renal disease," Emed.medscape.com January 2.
4. Kato A., "Pruritus and hydration state of stratum corneum in hemodialysis patients." American Journal of Nephrology, 20;437-42, 2000.
5. Maison Abdelbaqi-salhab, Shalhub S. Morgan, "Current review of the cutaneous manifestations of renal disease," Journal of cutaneous Pathology, 30: 527-538, 2003.
6. Masson P., France L, Rodrignes et al., "EEMCO guidance for the assessment of dry skin [xerosis] and ichthyosis: Clinic scoring systems," Skin research and technology, 1:109-124, 1995.
7. Mazen S Kurban, Adel Boverz, Abdul-Ghani Kibbi, "Cutaneous manifestations of chronic kidney disease". Clinics in Dermatology, 26:255-64, 2008.
8. Pradeep Arora, Mauro Verrelli. "Chronic Renal Failure. Medscape", Nephrology Updated: Feb 4, 2010.
9. Praveen kumar kola, Madhav Desai, Ram Mohan Patapati, B. Mastan Vali, Sunitha Pentyala. "Cutaneous manifestations in patients with chronic kidney disease on maintenance hemodialysis," International scholarly Research network ISRN Dermatology. Vol 2012, Article ID 679619, 2012.
10. "Rooks textbook of Dermatology," Eight edition, Wiley Blackwell chapter 62 pp 62 – 74.
11. Singh G, Singh SJ, Chakrabarthy N, Siddharaju KS, Prakash JC., "Cutaneous manifestations of chronic renal failure," Indian Journal of Dermatology Venereology Leprology, 5:167-9, 1989.
12. Stahle –Backdah M, Hagermark O, Lins Le., "Pruritus in patients on maintenance hemodialysis," Acta Med Scand, 224;55-60, 1988.