Original Article

Dermatological Manifestations in Chronic Renal Failure Patients on Haemodialysis

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ABSTRACT

OBJECTIVES: The study was carried out to evaluate the prevalence of dermatological problems in patients undergoing haemodialysis and to document the pattern of these skin alterations.
STUDY DESIGN: Prospective, descriptive.
METHOD: The study comprised of a total number of 300 clinically diagnosed cases of chronic renal failure belonging to either sex being managed by haemodialysis. A detailed dermatological examination of these patients was carried out. The results were recorded on a preformed performa.
RESULTS: There were 169 males and 131 females with the age range of 10-80 years. Maximum duration of dialysis was 9 years and minimum 1 month. Xerosis (90.66%) was the most common finding. Pruritus was present in (64.66%). Hyperpigmentation esp. diffuse (54%), oral lesions (69.3%) including xerostomia and gingival friability, nail changes (61.6%), including pale nails, polished nails and half and half nails and hair changes (56.6%), including dry coarse hair and loss of hair from scalp, arms and legs were also present. Other findings included haemorrhagic diathesis (easy bruisibility, bleeding gums and nasal bleeding), purpuric lesions, excoriation marks, lichenification, AV Shunt complications, cutaneous infections, hypopigmentation, delayed wound healing, hyperpigmented macules on palms and soles, calcinosis cutis, gynaecomastia, solar keratosis and kyrles disease.
CONCLUSION: There is a high prevalence of cutaneous changes in patients undergoing haemodialysis. At least one cutaneous change was found in 96% of patients. Xerosis was the most common finding followed by pruritus, diffuse hyperpigmentation, xerostomia, easy bruisibility, pale nails and half and half nails.

KEY WORDS: Dermatological Manifestations; Haemodialysis; Renal Failure; Xerosis; Pruritus.

INTRODUCTION

The introduction of regular intermittent haemodialysis has prolonged the lives of thousands of patients with chronic renal failure (CRF). Patients with end stage renal disease are managed initially with conservative therapy. Eventually, however they may require haemodialysis, peritoneal dialysis or renal transplantation.

Skin is the most visible and easily accessible organ of the human body. For a clinician, it may function as an important diagnostic window to diseases affecting internal organs. Patients of chronic renal failure undergoing haemodialysis have a high prevalence of cutaneous changes[1, 2]. Knowledge and accurate diagnosis of these cutaneous alterations is important. It will help in the proper management of these patients.

The study was carried out to evaluate the prevalence of dermatological problems and study the pattern, frequency, and complications of skin lesions in haemodialysis patients.

MATERIAL AND METHODS

The study was carried out visiting various major nephrology departments of the city. These included Nephrology Department Civil Hospital Karachi, Nephrology department of Jinnah Post Graduate Medical Centre and The Kidney Centre, Karachi. The study carried out during January 2007 to February 2009. During this period 300 hospitalized and diagnosed cases of chronic renal failure currently on haemodialysis were enrolled. All enrolled patients were followed up for period of two years. The detailed history and relevant dematologiccal examination done for each case and finding recorded on preformed proforma.

Routine investigations performed in all patients

- Complete Blood Picture - ESR.
- Urine D/R.
- Urea, Creatinine, Electrolytes.
- Random Blood Sugar (R.B.S)
- Serum Ca
- X-ray Chest

Investigations performed as and when needed:

- Scraping for KOH smear and subsequent culture.
- Swab for culture
- Nail clippings for fungus and subsequent culture.

Hair plucking for fungus and subsequent culture.
- Skin Biopsy.
- Liver function Test (L.F.T),
- Stool D/R.
- Antinuclear antibodies
- Anti DS DNA.
- RA factor.
- Serum Lipid Profile.
- PT , APTT

All the data were analyzed. Results were then tabulated and the dermatological problems in haemodialysis patients were evaluated.

Statistical Analysis

A database of the filled in questionnaires was developed in the EPI Info 6, a word processing database and statistical programme for public health.

The proportions (percentages) of different criteria related to a particular classification of tables were analyzed by the Chi Square test statistics to compare difference in percentages, where it was valid. For the data where expected frequency was less than 5, a yate's corrected Chi Square test was applied.

The results were considered significant where level of significance was P≤0.05, otherwise it was not significant.

RESULTS

The study comprised of 300 clinically diagnosed cases of chronic renal failure being managed by haemodialysis. One hundred sixty-nine patients were males (56.3%) with mean age of 50.58 ± 14.84 years ranging from 10-80 years and 131 were females (43.66%) with mean age of 49.82 ± 13.63 years ranging from 11-75 years (P=0.65). The age difference among sex was insignificant. Most of the cases (88, 29.3%) were in their 5th decade of life. About 68.3% of the cases were below 60 years of age. The commonest cause of end stage renal disease was hypertension found in 118 (39.33%) patients. Other causes included diabetes in 71 patients (23.6%), chronic nephritis in 82 patients (27.33%), obstructive uropathy (bilateral renal calculi) in 17 patients (5.6%), polycystic kidney disease in 8 patients (2.6%), SLE in 2 patients (0.66%) and postpartum hemorrhage in 1 patient (0.33%). Maximum duration of dialysis recorded was 9 years i.e. 108 months, while minimum was 1 month. The frequency of dialysis was twice per week in 233 patients (77.66%) and thrice per week in 67 patients (22.3%). Dialysis was of acetate type in 98 patients (32.6%) and of bicarbonate type in 202 patients (67.3%).

On general examination anemia was found in 193 patients (64.3%), oedema was present in 13 patients (4.3%), koilonychia was a finding in 2 patients (0.66%), jaundice was seen in one patient (0.33%) and clubbing was noted in 1 patient (0.33%). Atleast one cutaneous change was found in 288 patients (96%) (95% C.I. = 89.89-98.97). Out of these, 163 (56.6%) were males and 125 (43.4%) females. The cutaneous manifestation were more common in males than females and finding is statistically significant (P = 0.001, Chi-Square = 10.03.)

Xerosis was noted in 272 patients (90.66%). Generalized xerosis was a feature in 235 patients (86.39%). It was present with scaling in 55 patients (20.22%) and with ichthyosis in 23 patients (8.45%). Pruritus was found in 194 patients (64:66%). It was of mild to moderate intensity in 184 patients (64.84%) and of severe intensity in 10 patients (5.15%) (P = 0.001).

Hyperpigmentation was found in 163 patients (54.3%). Out of these, 84 (51.5%) were male and 79 (48.4%) female (P = 0.57). Diffuse Hyperpigmentation was present in 162 patients (99.3%). It was localized to the arm in one patient (0.6%). Hypopigmentation was seen in 12 patients (4%). Among these, 8 (66.6%) were males and 4 (33.3%) females.

Hypopigmentation in the form of hypopigmented macules on arms was found in 8 patients (66.6%) and on leg in 3 patients (25%). One patient (0.83%) had vitiligo like lesions on legs. Hyperpigmented macules were found on palms and soles of 78 (26%) patients (95% C.I.=17.06-36.58). Out of these, 40 (51%) patients were males and 38 (49%) females (P = 0.72). Hyperpigmented macules were seen on soles in 50 (64%) patients. They were present on the palms in 28 (35.89%) patients. Hyperpigmented macules were also seen on lower legs, shins and feet (dorsal aspect) of 6 (2%) patients (95% C.I.=0.23-7.01). Among these, 4 (66.6%) were males and 2 (33.3%) were females (P=0.56).

Among haemorrhagic complications, purpuric lesions were observed in 41 (13.6%) patients. (95% C.I.=7.21 -22.60). There were 21 (51.2%) males and 20 (48.7%) females (P=0.82). Haemorrhagic diathesis was a feature seen in 139 (46.33%) patients (95% C.I.=35.39-57.53). Among these, 69 (49.6%) were males and 70 (50.3%) females (P=0.90). Easy bruisibility was present in 102 (73.3%) patients. Bleeding gums were found in 32 (23%) patients. Nasal bleeding was a feature present in 19 (13.6%) patients.

Cutaneous infections were present in 14 (4.6%) patients (95% C.I.=1.35-11.06). Among these, 9 (64.3%) were males and 5 (35.7%) females (P=0.13, Chi-Square = 2.29). Bacterial infections were seen in 9 (64.3%) patients. Folliculitis was present in 6 (66.6%) patients, abscess in 2 (22%) and sycosisbarbae in one (11%) patient. Fungal infections were present in 5 (35.7%) patients. These included tineaversicolor in 3 (60%) patients, tineacruris in 1 (20%) patient and tineacorporis in 1 (20%) patient.

Miscellaneous skin findings included excoriation marks seen in 40 (13.3%) patients where 19(47.5%) were males and 21 (52.5%) were females. Lichenification was present in 24 (8%) patients. 13 (54%) being males and 11 (46%) females. Wrinkles were noted in 11 (3.6%) patients. Among these, 5 (45.4%) were males and 6 (54.5%) females. Nine (3%) patients suffered from delayed healing of wounds. Gynaecomastia was a feature present in 6 (2%) patients. Calcinosis cutis was seen in 6 (2%) patients. Four (66.6%) being male and 2 (33.3%) female. Four patients (1.3%) had solar keratosis. Three (75%) were males and 1 (25%) females. Acquired perforating dermatosis - Kyrle's disease (proven by biopsy) was a feature in 4 (1.3%) patients. Among these, 3 (75%) were males and 1 (25%) female. Eczema was seen in 2 (0.66%) patients. One male (50%) and 1 female (50%). Bullous eruptions (subepidermal) were found in 1 male patient.

Oral lesions were presented by 208 (69.3%) patients (95% C.I.=58.41 -78.921). Among these, 103 (49.5%) were males and 105 (50.4%) females. (P = 0.84). Oral lesions included xerostomia in 185 (88.9%) patients, 111 (58.7%) males and 78 (41.2%) females. Gingival friability in 32 (15.38%) patients and ulcerative stomatitis in 1 female (0.48%) patient.

Hair changes were present in 170 (56.6%) patients (95% C.I.=45.43-67.44), 68 (40%) were males and 102 (60%) females (P = 0.001, Chi-Square = 13.60). Hair was coarse and dry in 124 (72.9%) patients, 37 (30%) patients being male and 87 (70%) female. There was diffuse hair loss from scalp in 114 (67%) patients. Among these, 54 (47.36%) were males and 60 (52.6%) females. One hundred sixty (94%) patients had hair loss from arms and legs, 74 (46.25%) being male and 86 (53.75%) female.

Nail changes were seen in 185 (61.6%) patients (95% C.I.=50.47-72.06). Out of these, 115 (62%) patients were males and 70 (38%) females. (P = 0.001, Chi-Square = 28.89). Half and half nails were present in 68 (36.75%) patients, 48 (70.58%) being male and 20 (29.41%) female. Four (2%) patients had polished nails. Pale nails were seen in 177 (95.6%) patients. Among these, 86 (48.58%) were males and 91 (51.4%) females.

A-V shunt complications were seen in 77 (25.66%) patients (16.7 - 36.2) 95% C.I. Among these 47 (61%) were male and 30 (39%) female. (P = 0.01, Chi-Square =7.51). Bacterial infection at the site of A-V shunt was found in 2 (2.6%) male patients. Haematoma was found in 6 (7.8%) patients, 3 male (50%) and 3 female (50%). Aneurysms were a feature in 69 (89.6%) patients. Among these 39 (56.5%) were male and 30 (43.4%) were female.

DISCUSSION

In chronic renal failure, there is an irreversible deterioration in renal function. The resulting impairment of the excretory, metabolic and endocrine functions of the kidney leads to the development of the clinical syndrome of uraemia. The aim of all renal replacement techniques including haemodialysis[3] is to mimic the excretory functions of the normal kidney. These include excretion of nitrogenous wastes, maintenance of normal electrolyte concentrations and extracellular volume.

There is a high prevalence of cutaneous changes reported in patients undergoing haemodialysis[1, 2]. In our study, at least one cutaneous change was found in 96% of the patients (P=0.001, Chi-Square = 1.0.03). A study was conducted on "The prevalence of dermatological problems among patients on haemodialysis or peritoneal dialysis" in the University of Puerto Rico School of medicine[4]. This study showed cutaneous changes in 100% of the patients.

Xerosis was the most common finding in our study. It was present in 90.6% (P=0.001) of the patients. The factors that probably contributed to xerosis included, a reduction in size and functional abnormalities of eccrine sweat glands[5, 6], high doses of diuretics and alteration of vitamin A metabolism.

Pruritus was one of the most frustrating and disabling finding in these patients. It affects 50-90% of patients undergoing haemodialysis [7, 8]. It was present in 64.6% (P=0.001) of our patients. The incidence in Puerto Rico study[4] was 63% (P>0.72-n.s), being more prevalent in haemodialysis than peritoneal dialysis patients. A number of factors were responsible for pruritus. These included dry skin, inadequate dialysis[9], anaemia[10], peripheral neuropathy[11], uraemic toxins, and secondary hyperparathyroidism.

Pigmentary disturbances especially diffuse hyperpigmentation was a common feature. It was found in 54% (P = 0.57 n.s) of our patients. In Puerto Rico study, the incidence was 70% (P<0.006)[4]. The disturbances were seen equally in haemodialysis and peritoneal dialysis patients. It was probably due to retention of chromogens and increased melanogenesis in epidermis due to impaired renal processing of melanocyte stimulating hormone. Hyperpigmented macules on palms and soles were present in 26% (P=0.72 n.s) of our patients. Hypopigmentation in the form of hypopigmented macules approximately 1 x1cm, were present on arms and legs. Besides, 1 patient with vitiligo like lesions was also seen. Hypopigmentation was however not a very common feature. It was present in only 4% of our patients.

Abnormal hemostasis, characterized by a tendency to abnormal bleeding and bruising was also seen. Purpuric lesions were found in 13.6% patients. Tendency

to easy bruisibility, bleeding gums and nasal bleeding was a feature in 46.3% of our patients. It was observed that easy bruisibility and increased skin fragility were worse, the longer the patient was on dialysis.

These patients are therefore, more prone to infections[12]. Staphylococcus Aureus is a major cause of morbidity in haemodialysis patients. In our study, 4.60% (P=0.13, Chi-Square = 2.29) of patients suffered from different bacterial and fungal infections. Gynaecomastia was seen in 2% of patients. Acquired perforating dermatosis was present in 4 patients (1.3%). It was confirmed by biopsy of lesions. The cutaneous lesions of acquired perforating dermatosis consisted of hyperpigmented papules upto 1 cm in diameter, with a central keratinous plug. Extensor surfaces of the limbs were commonly affected. Pruritus was nearly always present. Calcinosis cutis[13], bullous eruptions[14], solar keratosis, delayed wound healing were other features that were less commonly present in our patients.

Around 73% (P=0.001) of patients had dry coarse hair. There was diffuse hair loss from scalp in 67% of patients. It could be due to multiple factors including malnutrition, anaemia, chronic illness, diabetes mellitus, anticoagulant drugs etc.

Cutaneous changes were also seen affecting the limb where the haemodialysis shunt was situated. These included Infections, haematoma and aneurysms.

Calciphylaxis[15] precancerous and cancerous lesions which are likely in patients undergoing regular haemodialysis[16-18] were not found in our patients. Complications due to the skin lesions in haemodialysis patients were also absent.

'Comparison of our study with Puerto Rico study[4] shows that pruritus, calcinosis cutis and perforating renal disease had matching results. Bullous dermatosis of haemodialysis was however absent in Puerto Rico Study[4].Keratotic pits of the palms and soles were a feature absent in our study but present in Puerto Rico Study[4].

Many of the skin changes described in patients with CRF are also found in patients undergoing haemodialysis[19]. On comparison of our study with a study on Skin changes in CRF patients[20], the results show marked similarity. Pruritus was however more common in our study. Also bullous dermatosis and kyrle's disease were not seen in CRF study[20].

CONCLUSION

There is a high prevalence of cutaneous changes in CRF patients on haemodialysis. The most common finding reported was xerosis. Pruritus was the most frustrating symptom. Pigmentary disturbances were also observed. Hyperpigmentation was mainly diffuse.

Other common findings included oral lesions, nail changes, hair changes, easy bruisibility, purpuric lesions, and A-V shunt complications. Rarer findings included hyperpigmented macules on palms and soles, lichenification, calcinosis cutis, wrinkles, gynaecomastia, delayed wound healing, acquired perforating dermatosis (Kyrle's disease), solar keratosis and bullous eruptions.

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