

Profile of Skin Manifestations in Chronic Kidney Failure Patients with Hemodialysis and Non-Hemodialysis in Universitas Sumatera Utara Hospital Medan

Dewi Sartika*, Imam Budi Putra**, Ariyati Yosi**

*Post graduate of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia

**Department of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia

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Abstract- Introduction: The skin and kidney constitute two main organ system in the human body, which partner many important functions and can occur in various diseases. In chronic kidney failure (CKF) generally shows skin manifestations associated with impaired kidney function.

Objective: To determine the description of skin disorders in CKF on hemodialysis and medical management, non- hemodialysis.

Methods: A descriptive study with cross-sectional design involving 86 subjects, including 43 each in maintenance hemodialysis and non-hemodialysis group. A detailed history was taken and complete dermatological examination was performed. Special investigations KOH mount for fungal, Tzank smear and skin biopsies were performed when clinically indicated.

Results: Total 86 subjects, 43 subjects with chronic kidney failure with hemodialysis and 43 subjects non-hemodialysis with the highest proportion was men (66.3%), the most distribution in the age group > 56 years (46.51%). The most common underlying disease lead to CKF was diabetic nephropathy (52.3%). The common nonspecific skin manifestations observed were xerosis in 73.2% (hemodialysis 44.18%, non-hemodialysis 29.06%), pruritus in 68.6% (hemodialysis 43.03%, non-hemodialysis 25.58%) with moderate pruritus 26.7%, hyperpigmentation in 59.3% (hemodialysis 40.69%), non-hemodialysis 17.60%). Nail changes were observed in 54.6% (hemodialysis 39.53%), non-hemodialysis 15.11%). Hair changes in 15.11% (hemodialysis 12.79%, non-hemodialysis 2.32%). *Puncture marks* were found 27.90% of the hemodialysis patients.

Conclusion: Skin manifestations that found in CKF with hemodialysis and non-hemodialysis, frequent in non-specific skin manifestations were xerosis, pruritus, hyperpigmentation, *half-half nails*, telogen effluvium and xerostomia. The specific skin manifestations were infections.

Index Terms- chronic kidney failure, skin manifestations, hemodialysis, non-hemodialysis

I. INTRODUCTION

kin is the largest organ and as a mirror that can project from a systemic condition with skin manifestations^{1,2,3} Various systemic diseases such as gastrointestinal disease, hepatobiliary system, cardiopulmonary system, endocrine disease and kidney disease often indicate skin manifestations.^{4,5,6} Chronic kidney failure is a condition progressive irreversible loss of kidney function.⁷ Skin manifestations occur in CKF, especially in patients undergoing hemodialysis.⁸ This has a role in decreased quality of life.^{7,8} The incidence of skin disease in patients with CKF is increased stated 50-100% of patients with CKF have at least one dermatological disorder, skin and nail changes which can occur before or after hemodialysis.⁸ Thomas et al stated that almost all patients with chronic renal failure (97%) have one or more skin manifestations.⁹

Rashpa et al examined the prevalence of skin diseases in patients with CKF, reported to 122 patients who participated found xerosis in 93 patients (76.2%), pale in 61 (50%), pruritus in 57 (46.7%), pigmentation disorders in 47 (38.5%) and purpura in 18 (14.8%). Nail changes were pallor (35.2%), absence of lunulas (23.8%), discoloration of nails (18%) and half-half nails (16.4%).¹⁰

Khanna et al in 2010 in India conducted a study comparing skin manifestations in CKF with hemodialysis and non-hemodialysis and found that 96% of patients had at least one skin manifestation. Xerosis is the most common manifestation of the skin in 75% of patients followed by 50% pigmentation disorders, pruritus 36%, 29% infection, half-half nail 28% and absence of lunula in 22% of patients.¹¹

Although research on skin manifestations in CKF is mostly done, but the skin manifestations of hemodialysis and non-hemodialysis patients with chronic renal failure are still few, so researchers want to examine skin changes in patients with chronic renal failure with hemodialysis and non-hemodialysis at the University Hospital of North Sumatra.

II. METHODS

This is a descriptive study with cross-sectional design involving 86 subjects including 43 chronic kidney failure with hemodialysis and 43 non-hemodialysis. Skin manifestations are diagnosed through history taking, clinical examination.

Special investigations KOH mount for fungal, Tzank smear and skin biopsies were performed when clinically indicated.

This study has been approved by the Health Research Ethics Commission of the Faculty of Medicine, Universitas Sumatera Utara/ H. Adam Malik General Hospital Medan.

Total 86 subjects, 43 subjects CKF undergoing hemodialysis and 43 subjects non-hemodialysis with the highest proportion was men (66.3%) and female (33.7%), the highest distribution in the age group > 56 years (46.51%). The mean of age 52.82±12.2. The most common underlying disease lead to CKF in our study was diabetic nephropathy (52.3% cases) (Table 1)

III. RESULTS

No	Etiology of Chronic Kidney Failure	Number of Cases	Percentage Cases
1	Diabetic Nephropaty	45	52.32
2	Hypertensive	19	22.09
3	Obstructive Nephropathy	13	15.11
4	Primary Glomerulopathy	4	4.65
5	Polycystic Kidney Disease	3	3.48
6	Gouty Nephropathy	1	1.16
7	Lupus Nephritis	1	1.16
Total		86	100

Xerosis was the most common nonspecific manifestation observed in 73.25% patients (hemodialysis 44.18%, non-hemodialysis 29.06%). Pruritus was the second most common finding constituting in 68.6% patients (hemodialysis 43.03%, non-hemodialysis 25.58%) with moderate pruritus 26.7%. Hyperpigmentation was found in 59.3% patients (hemodialysis 40.69%), non-hemodialysis 17.60%). Face and extremities were commonly affected.

Out of the 86 patients, 54.6% had nail changes (hemodialysis 39.53%, non-hemodialysis 15.11%). *Half half*

nail was the highest nail changes found in 29.06% patients (hemodialysis 41.8%, non-hemodialysis 16.27%) and the lowest in nail changes was absent lunula found only in the hemodialysis group 4.65%. Hair changes was noted in 15.11% patients (hemodialysis 12.79%, non-hemodialysis 2.32%). Xerostomia were the highest mucosal changes noted in 34.88% patients. Puncture marks were only found in the hemodialysis group 27.90% (Table 2).

No.	Skin Manifestation	Hemodialysis	Non Hemodialysis	Total
1.	Xerosis	38 (88.37%)	25 (58.13%)	63 (73.25%)
2.	Pruritus	37 (86.04%)	22 (51.16%)	59 (68.60%)
3.	Hyperpigmentation	35 (81.39%)	16 (37.20%)	51 (59.30%)
4.	Pallor	15 (34.88%)	5 (11.62%)	20 (23.25%)
5.	Echymosis	4 (9.30%)	0 (0%)	4 (4.65%)
6.	<i>Half half nail</i>	18 (41.8%)	7 (16.27%)	25 (29.06%)
7.	Pallor nail	12 (27.90%)	5 (11.62%)	17 (19.76%)
8.	Absen Lunula	2 (4.65%)	0 (0%)	2 (2.32%)
9.	<i>Clubbing nail</i>	2 (4.65%)	1 (2.32%)	3 (3.48%)
10.	Telogen effluvium	10 (23.25%)	2 (4.65%)	12 (13.95%)
11.	Diffuse Alopecia	1(2.32%)	0 (0%)	1 (1,16%)
12.	Xerostomia	22 (51.16%)	8 (18.60%)	30 (34.88%)
13.	Ulcerative Stomatitis	10 (23.25%)	2 (4.65%)	12 (13.95%)
14.	Angular cheilitis	4 (9.30%)	2 (4.65%)	6 (6,97%)
15.	Macroglossia	2 (4.65%)	0 (0%)	2 (2.32%)
16.	Gingivitis	1 (2.32%)	0 (0%)	1 (1.16%)
17.	Sclera Icterus	8 (18.60%)	0 (0%)	8 (9.30%)
18.	<i>Puncture marks</i>	24 (55.81%)	0 (0%)	24 (27.90%)

Skin infections were observed in 29.06% patients, fungal in 19.76% patients (hemodialysis 23.25%, non-hemodialysis 16.27%), bacterial 8.13% patients (hemodialysis 13.95%, non-hemodialysis 2.32%), viral only in non-hemodialysis 1.16% patients. Other skin manifestation

included stasis dermatitis, lichen simplex chronic and acne vulgaris seen in each 2.32% patients, seborrheic dermatitis observed only in hemodialysis group 2.32% patients and melasma seen in 3.48% patients (Table 3).

No	Manifestasi Kulit	Hemodialysis	Non Hemodialysis	Total
1.	Fungal Infections	10 (23.25%)	7 (16.27%)	17 (19.76%)
2.	Bacterial Infections	6 (13.95%)	1 (2.32%)	7 (8.13%)
3.	Viral Infections	0 (0%)	1 (2.32%)	1 (1.16%)
4.	Seborrheic Dermatitis	1 (2.32%)	0 (0%)	1 (1.16%)
5.	Stasis Dermatitis	1 (2.32%)	1 (2.32%)	2 (2.32%)
6.	Lichen Simplex Chronic	1 (2.32%)	1 (2.32%)	2 (2.32%)
7.	Acne Vulgaris	2 (4.65%)	0 (0%)	2 (2.32%)
8.	Melasma	2 (4.65%)	1 (2.32%)	3 (3.48%)

IV. DISCUSSION

Out of 86 subjects of CKF in this study, the highest proportion was male, 57 subjects (66.3%) and 29 subjects were women (33.7%), the highest distribution in the age group of 56 above (46.51%). A similar study by Chanda et al in India also showed that out of 100 patients, 72% were men and 28% were women.¹² Rashpa et al also reported male to female ratio of 17:1.¹⁰ In Egypt, reported of 93 patients 60.2% were men and 39.8% were women.¹

The most common etiology of CKF in our study was diabetic nephropaty (52.32%), followed by hypertensive (22.09%), obstructive nephropaty (15.11%). A similar study by Shrestha et al in Nepal and Chanda et al reported the most common etiology of chronic kidney failure was diabetic nephropaty and hypertensive.^{12,13} Study Khanna et al in India reported different etiology in India, where out 100 patients, most common etiology was chronic glomerulonephritis (45%) followed by diabetic nephropaty (22%) and hypertensive (12%). The high incidence of diabetic nephropaty is associated with microvascular complications diabetes mellitus.¹¹

Xerosis was the most common nonspecific skin manifestations noted, with overall prevalence 73.25%. hemodialysis group higher compared to non-hemodialysis patients (88.37%). Similar studies by Foludun et al and Chanda et al reported xerosis was 86% and 61%, respectively.^{12,14} The higher prevalence of xerosis, could be to skin barrier impaired, irritants, eccrine impaired, metabolic imbalance and high doses diuretics.¹⁴

Pruritus was the second most common manifestation in our study found in 68.60%, hemodialysis group (86.04%) has higher prevalence compared to the non-hemodialysis group (55.16%). Recent reports show that 20-50% are affected. Asokan et al reported pruritus in 44.3% of hemodialysis group and 53.1% non-hemodialysis group.¹ Galperinta et al reported there was relationship between the onset and severity of pruritus with severity chronic renal failure and hemodialysis.¹⁵ Pruritus was thought to be mediated by xerosis and

hyperparathyroid which are commonly found in patients with chronic kidney failure.^{14,15}

Hyperpigmentation was found in 59.30% patients, hemodialysis group 81.39% had higher prevalence compared to non-hemodialysis group (37.20%) with the most common predilection found in the extremities and face. Chanda et al observed pigmentary changes in 42% of patients.¹² Smiths et al reported pigmentation and increased b-MSH values in both undialysed and dialysed patients.¹¹

Skin pallor observed 23.25% in our study. A similar study reported in India found 17.5% patients.¹² Malnutrition and iron deficiency anemia superimposed on the anemia of chronic disease, may result in a higher prevalence of skin pallor.¹

Ecchymosis was found only in hemodialysis group 9.30%. A similar study Mourad et al reported ecchymosis found in 47.3% in chronic kidney failure.⁴ Udayakumar et al reported ecchymosis in chronic kidney failure with hemodialysis caused by platelet fuction disorder, use of heparin during hemodialysis and increased vascular fragility.¹⁶

Nail changes were reported between 30-50% of patients with CKF.¹ In our study, nail changes were observed 54.6%. half half nail, the characteristic nail change in chronic kidney failure was observed 29.06% of the patients. Other nail changes observed in this study were pallor nail (19.76%), clubbing nail (3.48%) and absent lunula (2.32%). Half half nail associated with azotaemia and an increase in melanin tissue by MSH. Pallor nail are associated with anemia.⁷

Hair changes like telogen effluvium and diffuse alopecia have been reported to occur frequently in chronic kidney failure.⁷ In this study, hair change was observed in 15.11% of patients and included telogen effluvium 23.2% hemodialysis group and 4.6% non- hemodialysis group, diffuse alopecia only found in hemodialysis group 2.3%. similar studies Chanda et al and Peres et al reported hair changes 23.25% and 26.9%.^{7,12}

Mucosal changes are common in patients with chronic kidney failure and can be due dehydration, mouth breathing, high concentration of urea and failure to

breakdown to ammonia.¹ Xerostomia observed in 34.88% patients, ulcerative stomatitis 13.95% patients, angular cheilitis 6.67% patients, macroglossia 2.32% patients. Pradhan et al in 2018 reported of 100 patients with chronic kidney failure had xerostomia, macroglossia, ulcerative stomatitis and angular cheilitis in 39% patients.¹⁷

Local complication such puncture marks found in 27.90% patients with hemodialysis in this study. A similar study supported by Chanda et al reported that 37 of 50 patients with hemodialysis had puncture marks.¹²

Other skin manifestation in our study were fungal infections (19.76%), bacterial infections (8.13%), viral infections (2.3%), seborrheic dermatitis (1.16%), stasis dermatitis (2.23%), lichen simplex chronic (2.32%), acne vulgaris (2.32%) and melasma (3.48%). The high prevalence of skin infection is an expected finding in these patient due lymphopenia, decreased B cell activity, and alteration of the T cell subsets and activities.^{1,3}

V. COCLUSION

In patients with chronic kidney failure, xerosis, pruritus, hyperpigmentation, nail changes and skin infections were the predominant skin manifestation. Skin manifestation is higher in hemodialysis patients compared to non-hemodialysis patients. Awareness of the skin manifestations facing this patient is especially important, as prevention and early treatment reduce morbidity and improve quality of life.

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AUTHORS

First Author – Dewi Sartika, Post graduate of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara, dwsartika10@gmail.com

Second Author- Imam Budi Putra. Departemen of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara

Third Author- Ariyati Yosi, Departemen of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara

Correspondence Author – dr. Dewi Sartika, email : dwsartika10@gmail.com