Dermatology Life Quality Index in Thai Dialysis Patients with Cutaneous Manifestations: A Cross-Sectional Study and Review

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Abstract

Objectives: End-stage renal disease (ESRD) patients who are on dialysis usually have cutaneous changes in multiple aspects such as pruritus, dry skin and hyperpigmentation. These symptoms usually lead to psychological distress and are sometimes neglected by dermatologists and nephrologists. The aim of our study is to evaluate dermatologic-specific, health-related quality of life (QoL) of Thai ESRD patients who are on hemodialysis (HD) or continuous ambulatory peritoneal dialysis (CAPD) and have cutaneous symptoms at Vajira Hospital.

Methods: A cross-sectional study was done during August 2014 at Vajira Dialysis Unit. ESRD patients who are on HD or CAPD and have cutaneous symptoms were enrolled. The patients were fully examined by the dermatologist. Patient's demographic data and cutaneous manifestations were recorded. The validated Thai version of the Dermatology Life Quality Index (DLQI) questionnaires were used for evaluation of QoL of the patients.

Results: Of 77 patients enrolled, 37 were females and the rest were males. The mean (SD) age at evaluation time was 57 (±15) years. The prevalence of abnormal cutaneous manifestations was 100%. The most common abnormality was xerosis (100%), followed by pruritus (94.8%), and hyperpigmentation (49.4%). The mean disease duration of dialysis (SD) before evaluation was 4 years. The mean total DLQI score was 4.74 (±2.58), and there was no statistical significance between patients who underwent CAPD compared to those with HD. However, the clinical intensity of xerosis was a significant prognostic factor for DLQI worsening ($r=0.639$, $p<0.0001$), and a significant correlation between pruritus intensity and the impairment of DLQI ($r=0.764$, $p<0.0001$) was also demonstrated.

Conclusion: The impact of abnormal cutaneous abnormalities in dialysis patients on dermatologic-specific, health-related QoL were high, especially xerosis and pruritus which appears to be underestimated in clinical practice. More careful treatment of these symptoms should not be abandoned to improve the QoL on dialysis patients.

Keyword: Thai, Dermatology Life Quality Index (DLQI), cutaneous manifestations, end-stage renal disease

การศึกษาคุณภาพชีวิตทางผิวหนังของผู้ป่วยโรคไตวายเรื้อรังระยะสุดท้ายที่ได้รับการฟอกเลือดหรือล้างไตทางช่องท้องอย่างถาวรที่มีภาวะแทรกซ้อนทางผิวหนัง

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บทคัดย่อ

วัตถุประสงค์: ผู้ป่วยโรคไตวายเรื้อรังระยะสุดท้ายที่ได้รับการล้างไตมักพบความผิดปกติทางผิวหนังร่วมด้วย ไม่ว่าจะเป็นอาการคัน ภาวะผิวแห้ง หรือภาวะผิวคล้ำ ซึ่งภาวะเหล่านี้มักถูกละเลยจากแพทย์ เพื่อศึกษาคุณภาพชีวิตทางผิวหนังในผู้ป่วยโรคไตระยะสุดท้ายที่ได้รับการฟอกเลือดหรือล้างไตทางช่องท้องถาวร และมีอาการทางผิวหนัง ที่คณะแพทยศาสตร์วชิรพยาบาล

วิธีดำเนินการวิจัย: เป็นการศึกษาเชิงพรรณนา ณ จุดเวลาใดเวลาหนึ่งในช่วงเดือนสิงหาคม 2557 โดยศึกษากลุ่มตัวอย่างที่หน่วยล้างไต คณะแพทยศาสตร์วชิรพยาบาล โดยผู้ป่วยจะได้รับการเก็บข้อมูลโดยการ ซักประวัติ ตรวจร่างกาย และตอบแบบสอบถาม โดยแพทย์ผิวหนัง ด้วยการใช้แบบสอบถาม Dermatology life quality index (DLQI) ฉบับภาษาไทยซึ่งมีความเที่ยงตรงและเชื่อถือได้

ผลการวิจัย: กลุ่มตัวอย่างจำนวน 77 คน เป็นหญิง 37 คน เป็นชาย 40 คน โดยอายุเฉลี่ยของผู้ป่วย ณ เวลาที่ทำการศึกษาคือ 57 (±15) ปี โดยความชุกของความผิดปกติทางผิวหนังที่ตรวจพบเท่ากับร้อยละ100 โดยความผิดปกติที่พบมากที่สุด คือภาวะผิวแห้ง (ร้อยละ 100) รองลงมาคือ อาการคัน (ร้อยละ 94.8) และภาวะผิวคล้ำ (ร้อยละ 49.4) ตามลำดับ ค่าเฉลี่ยมาตรฐานของเวลาที่ผู้ป่วยได้รับการล้างไตก่อนทำการศึกษาคือ 4 ปี และค่าเฉลี่ยคะแนนคุณภาพชีวิตทางผิวหนัง (DLQI score) คือ 4.74 (±2.58) โดยพบว่าคุณภาพชีวิตทางผิวหนังของผู้ป่วยที่ล้างไตทางหน้าท้อง และล้างไตโดยการฟอกเลือดนั้นไม่แตกต่างกัน แต่พบว่า ความรุนแรงของภาวะผิวแห้งมีความสัมพันธ์กับคุณภาพชีวิตทางผิวหนังที่แย่ลงของผู้ป่วย อย่างมีนัยสำคัญทางสถิติ ($r=0.639$, $p<0.0001$) และยังพบว่าความรุนแรงของอาการคันมีผลทำให้คุณภาพชีวิตทางผิวหนังแย่ลงด้วยเช่นกัน ($r=0.764$, $p<0.0001$)

สรุป: การมีความผิดปกติทางผิวหนังในผู้ป่วยไตวายระยะสุดท้าย มีผลกระทบต่อคุณภาพชีวิตในระดับสูง โดยเฉพาะอย่างยิ่งภาวะผิวแห้ง และอาการคัน ดังนั้นการให้การรักษาอาการเหล่านี้จึงมีความสำคัญ และไม่ควรละเลย

Background

End stage renal disease (ESRD) patients who are undergoing maintenance renal dialysis (MRD) are now increasing in large numbers. These patients are not only suffering from their own renal disease, but also from their cutaneous abnormalities. Skin changes in dialysis patients are characterized by different aspects such as pruritus, xerosis cutis, and hyperpigmentation. Several studies suggested that cutaneous abnormalities are presented in more than half of ESRD patients.[1] As a result of its chronicity, it is generally accepted that these patients have psychological distress, which is sometimes underestimated by physicians. Lack of reliable measurement is the main reason why psychological assessment is usually neglected.[2] Nowadays, there are several self-reporting instruments that have been developed and validated for measuring quality of life (QoL) in patients with skin diseases. Different methods were used such as interviews, questionnaires, scales or indexes.[3] Quality of life questionnaires are frequently used in dermatology. Previous studies in vitiligo, fungal infection, melanoma, psoriasis, urticaria and scleroderma all have used these questionnaires.[4,5] However, the data for dermatology-specific, health-related QoL in Thai dialysis patients is still lacking. Therefore, the purpose of our study was to evaluate the quality of life of ESRD patients who are undergoing MRD in Thailand by using Dermatology Life Quality Index (DLQI) questionnaires and also assessing demographic data and other personal factors that affect the degree of the patients' well-being.

Methods

This study was approved by Vajira Hospital Institutional Review Board. The study design was a cross-sectional descriptive study. The ESRD patients who were literate, with an age of more than 18 years old, who attended the out-patient Nephrology Clinic at Vajira Hospital were included in the study. The demographic data, information about ESRD, skin manifestations, and previous treatment information was gathered directly from the patients and recorded in the case record form. All patients were examined by the same well-trained physician to complete the physical examinations and evaluate disease intensities. The intensity of pruritus was assessed by the patients, using 10-CM visual analog scales (VAS; from 0 = no itch at all, to 10 = extreme itch). Xerosis intensity was evaluated by using the xerosis severity score (El-Gammal severity score) on the following body sites: chest, forearm without arteriovenous shunt, and the two lower legs. The El Gammal index includes five items: 0 = smooth skin; 1 = patches of fine, powdery scales; 2 = diffused, ashy appearance with many fine scales; 3 = moderate scaling with beginning cracks. A total score was deduced for each patient by summing the scores of each site.

Dermatology Life Quality Index

The use of the Thai version of the DLQI questionnaire for our study was formally granted permission by Professor A.Y. Finlay. DLQI is a specific scale assessing the impact of dermatological diseases on patients' quality of life. It is self-explanatory, and easily handled by the patients. It is composed of 10 questions and 6 domains regarding the previous 7 days. The six domains include symptoms and feelings (2 questions), daily activities (2 questions), leisure (2 questions), work and school (1 question), personal relationships (2 questions) and treatments (1 question). The DLQI questionnaire was translated into Thai by Kulthanan, et al.[4] It was first translate into Thai and then back to English by a bilingual person to ensure that the Thai-translated version was correct and did not introduce any misconceptions or misunderstanding. The validity and reliability of Thai version of the DLQI was also done by Kulthanan, et al which indicated high validity and good reliability.[4] Each question was short and easy to understand, and our patients were asked to finish the questionnaires without any assistance. The total DLQI score was calculated by accumulating the score of each question (graded from 0 to 3) resulting in a

minimum of 0 and a maximum of 30. The higher the score, the more quality of life is compromised. The interpretation of DLQI scores can be categorized as follows: 0-1 = no effect at all, 2-5 = small effect, 6-10 = moderate effect, 11-20 = very large effect, 21-30 = extremely large effect.[3]

Statistical analysis

All analyses were performed using SPSS software version 22. Continuous data were described as mean and standard deviation. The statistical comparisons of the DLQI results between subpopulations were performed using Mann-Whitney U Test. A p-value < 0.05 was considered to be statistically significant. Correlation analysis was made using Pearson's Correlation Test.

Results

Of 77 patients enrolled, 37 were female and the rest were male. Table 1 shows demographic data of the patients. The mean (SD) age at evaluation time was 57 (± 15) years. The mean dialysis duration was 4 years and the main cause of ESRD of our patients was hypertensive nephropathy. Thirty-two of them (41.6%) had previous diagnosis of other underlying diseases such as diabetes mellitus, hypertension, dyslipidemia, coronary artery disease, and cerebrovascular disease. Cutaneous manifestations are shown in Table 2. Xerosis was found in all patients (100%), followed by pruritus (94.8%), and diffuse hyperpigmentation (49.4%) respectively. Thirteen patients of the CAPD group had

Table 1:

Demographic data of subjects (N=77)

	Number (%)		
	Total (n=77)	HD (n=35)	CAPD (n=42)
Gender (M:F)	40:37	18:17	22:20
Age (years)	57 ± 15	62 ± 15	52 ± 13
Dialysis duration (years)	4 (0.25-15)	6 (0.25-15)	3 (1-6)
Frequency of dialysis			
Times/day		0	4 (4-6)
Times/week		3 (1-3)	0
Cause of ESRD			
Chronic glomerulonephritis	6 (7.8)	4 (11.4)	2 (4.8)
Diabetic nephropathy	32 (41.6)	16 (45.7)	16 (38.1)
Hypertensive nephropathy	37 (48.1)	13 (37.1)	24 (57.1)
Others	2 (2.6)	2 (5.7)	0
Underlying disease			
Diabetes mellitus	32 (41.6)	16 (45.7)	16 (38.1)
Hypertension	76 (98.7)	34 (97.1)	42 (100)
Dyslipidemia	55 (71.4)	23 (65.7)	32 (76.2)
Coronary artery disease	9 (11.7)	8 (22.9)	1 (2.4)
Cerebrovascular disease	10 (13)	9 (25.7)	1 (2.4)
Others	20 (26)	12 (34.3)	8 (19)

pericatheter dermatitis. Almost half of them (46.8%) had androgenetic alopecia. Nail abnormalities were found in 21 patients (27.3%). Most of them were half and half nail. Other uncommon cutaneous abnormalities were not found in our study. Figure 1a shows details of the mean score of DLQI in all ten questions categorized by type of dialysis. The main contributing factor to DLQI alteration was question 1 (symptoms) followed by question 4 (clothes). However, question 7 (studying or working) didn't effect all of the patients. The mean DLQI score of ESRD patients who underwent HD was higher than those with CAPD in almost 10 questions, except for question 4 (clothes) and question 6 (sport). Figure 1b represented the details of the mean DLQI scores in all 10 questions according to sex. Interestingly, males have a higher score of mean DLQI than females in almost 10 questions, except for question 10 (treatment difficulties). The mean total DLQI score was 4.74 (± 2.58), and there was no statistical significance between patients who underwent CAPD compared to those with HD (Table 3).

Table 2:

Cutaneous manifestations of ESRD patients

	Number (%)		
	Total (n=77)	HD (n=35)	CAPD (n=42)
Skin :			
Xerosis	77 (100)	35 (100)	42 (100)
Pruritus	73 (94.8)	33 (94.3)	40 (95.2)
Diffuse hyperpigmentation	38 (49.4)	20 (57.1)	18 (42.9)
Pericatheter dermatitis	13 (16.9)	0	13 (31)
Hair :			
Androgenetic alopecia	36 (46.8)	17 (48.6)	19 (45.2)
Normal	41 (53.2)	18 (51.4)	23 (54.8)
Nail :			
Half and half nail	15 (19.5)	12 (34.3)	3 (7.1)
Onycholysis	4 (5.2)	2 (5.7)	2 (4.8)
Subungual hyperkeratosis	2 (2.6)	2 (5.7)	0
Normal	56 (72.7)	19 (54.3)	37 (88.0)

Table 3:

Xerosis severity score, Pruritus score and DLQI score (mean ± SD)

	Type of Dialysis		
	HD	CAPD	p value[a]
Xerosis severity score	3.26 ± 1.31	3.31 ± 1	0.583
Pruritus score (VAS)	4.74 ± 2.52	3.76 ± 1.43	0.087
Mean DLQI score	5.34 ± 3.51	4.24 ± 1.27	0.842

a Mann-Whitney u test, $\alpha = 0.05$

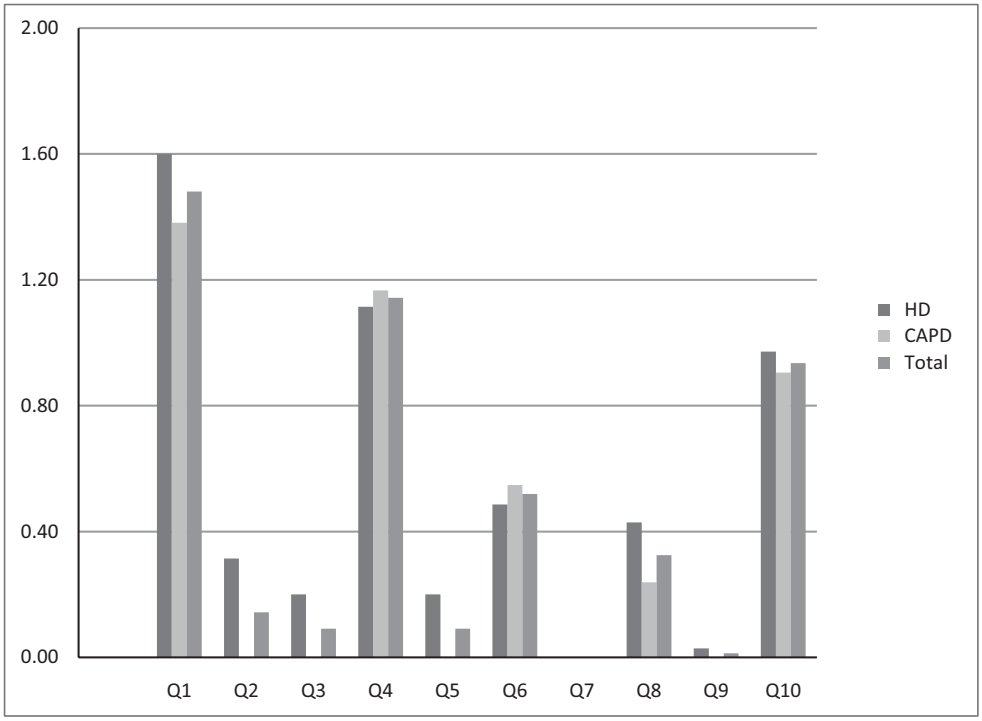

Figure 1a: The mean score of Dermatology Life Quality Index according to type of dialysis

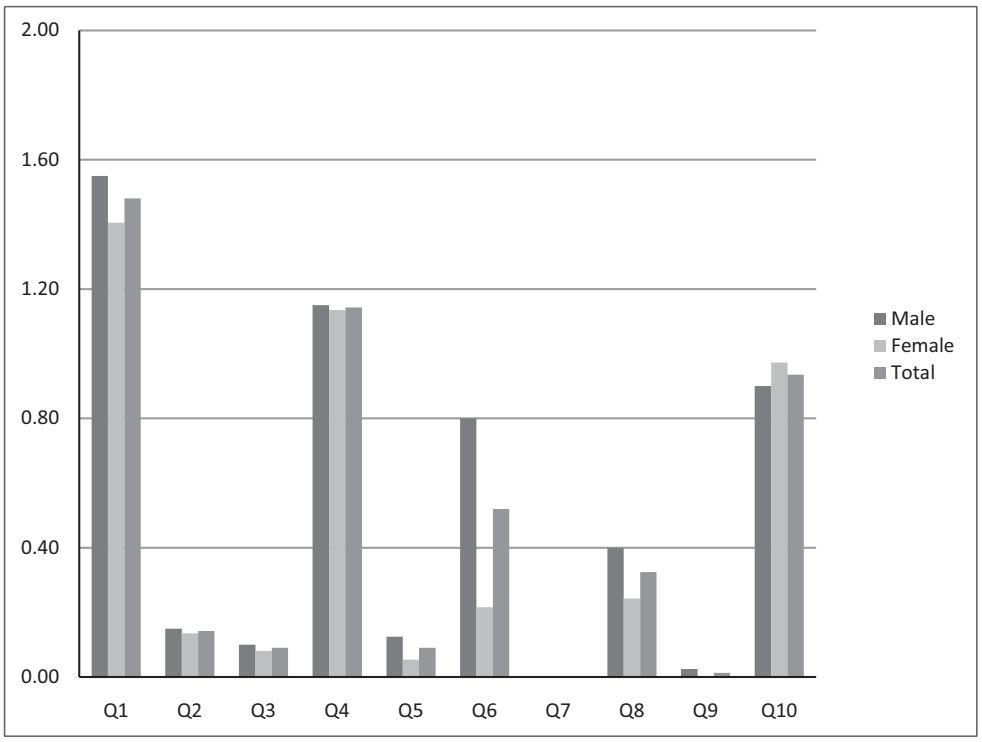

Figure 1b: The mean score of Dermatology Life Quality Index in all 10 questions according to sex

According to the interpretation of DLQI score by Finley, et al, Table 4 shows the result of our study. Of 77 patients, 57 patients had a small effect to their quality of life while 16 patients had a moderate effect. Only 3 patients had very large effects of cutaneous manifestation to their quality of life. Figure 2a shows the significant correlation between the clinical intensity of xerosis and DLQI worsening ($r=0.639$, $p<0.0001$). Moreover, a significant correlation between the intensity of pruritus and the impairment of DLQI ($r=0.764$, $p< 0.0001$; Figure 2b) was also demonstrated.

Discussion

Cutaneous abnormalities are common among patients with ESRD. Cutaneous examination of these patients has shown that 50-100% of patients have at least one dermatologic condition which ranges from the nearly universal xerosis and pruritus to uncommon conditions such as hyperpigmentation of the exposed area, purpuric skin changes, acquired perforating dermatosis and nail abnormalities.[1]

Previous study of prevalence of abnormal cutaneous manifestations in Thai ESRD patients who are on MRD was 100%. The most common abnormality was xerosis (100%), followed by pruritus (56.3%) and diffuse hyperpigmentation (56.3%) respectively.[6] Our study interestingly showed similar results to that of Choovichian, et al, which revealed that xerosis (100%) is the most common skin finding among these patients, followed by pruritus and diffuse hyperpigmentation.

Several studies showed that xerosis is the most common chronic cutaneous condition in ESRD patients undergoing MRD, whereas these symptoms can be found in 40% of ESRD patients before starting MRD.[2,7,8]

Uremic xerosis is a condition resulting from persistent barrier dysfunction which leads to skin dehydration. Glycerol decreasing in the stratum corneum is not only the main reason that causes xerosis in uremic patients, but it also correlates with the severity of the xerosis and skin barrier alterations.[9] Uremic xerosis often effects the entire surface of the body, but may intensify in some areas such as the hands and feet. Its clinical picture is composed of a dry skin appearance, scaling and roughness.[10] Although uremic xerosis is easy to identify, it is often abandoned by physicians. Previous study showed that uremic xerosis had a negative, psychological impact on ESRD patients.[11] The mean DLQI score was significantly higher compared with the normal population, and treatment with moisturizing emollient significantly improved patients' life quality.[12] Our study also shows correlation between the clinical intensity of xerosis and DLQI worsening. Uremic xerosis is always associated with uremic pruritus. Although the etiology of pruritus in CRF remains unknown, several studies suggested that the severity of pruritus has been directly correlated with the clinical degree of xerosis; the more intense the xerosis, the greater the amount

Table 4:

Dermatology life quality index (DLQI) scores according to type of MRD

DLQI	Type of dialysis (n)	
	HD	CAPD
0-1 (no effect at all)	1	0
2-5 (small effect)	21	36
6-10 (moderate effect)	10	6
11-20 (very large effect)	3	0
21-30 (extremely large effect)	0	0

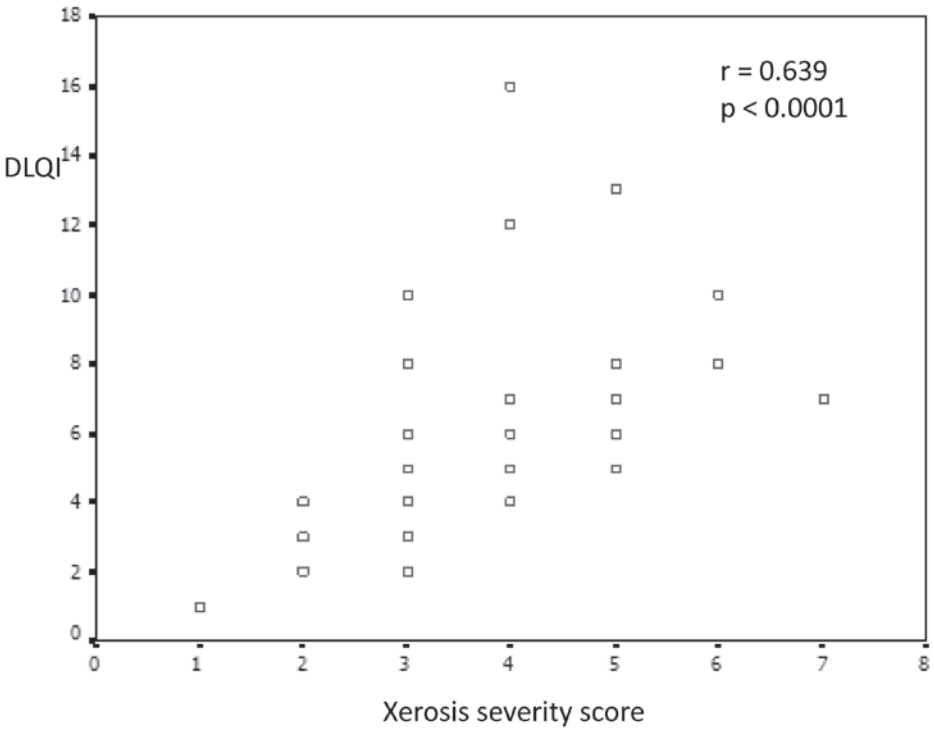

Figure 2a: Dermatology Life Quality Index (DLQI) scores according to xerosis intensity (total score) using Pearson's Correlation Test.

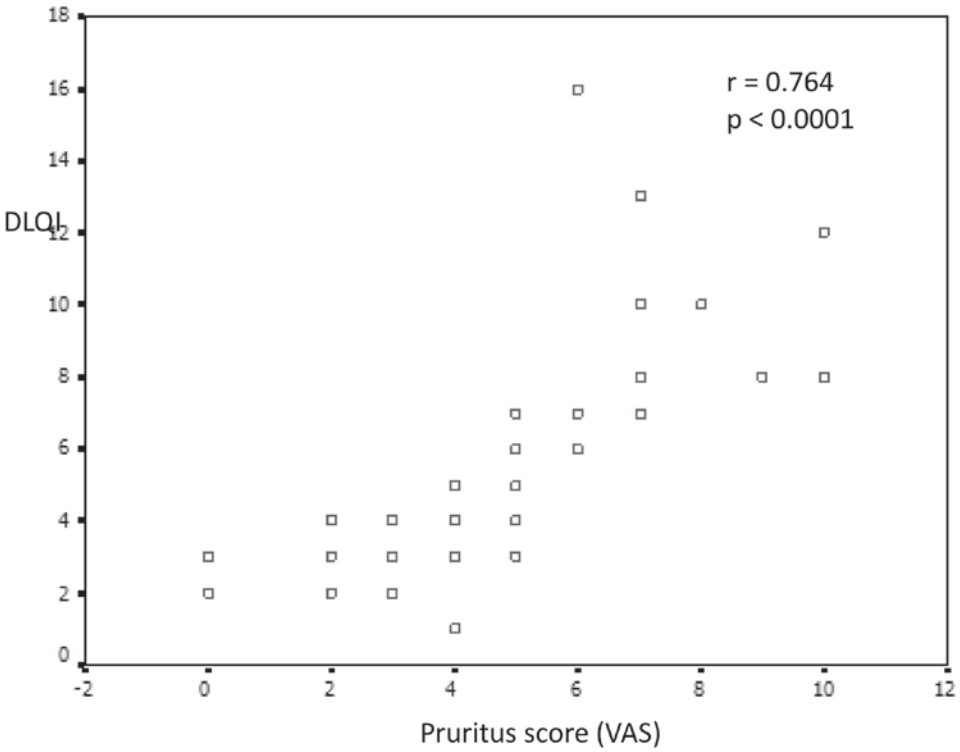

Figure 2b: Dermatology Life Quality Index (DLQI) scores according to pruritus intensity (visual analogue scale; VAS)

of pruritus.[13] A large series of 130 MRD patients postulated that pruritus was shown more significantly in patients with xerosis (34%) compared to those without xerosis (21%).[14]

It has been postulated in other ethnicities that uremic xerosis and pruritus have played a significant impact on the quality of life of MRD patients.[2] Our study also oriented that these conditions were the detrimental cause of dialysis patients' quality of life alteration. The mean total DLQI score of our 77 patients was 4.74 (± 2.58), which means that it has a negative impact on patients' quality of life. However, there was no significant correlation between MRD modalities and DLQI alteration. Our results were the same as the results of many studies conducted to date.[2] Moreover, Choovichian, et al. also reported that there was no significant correlation between xerosis severity, pruritus or diffuse hyperpigmentation and MRD modalities.[6] Pontocelli, et al also proposed that there were no differences in frequency or severity of pruritus between patients who underwent CAPD or those with HD.[15]

When we compared our DLQI results to Kulthanan, et al's previous report[4] it was quite similar to that of patients with melasma (6.0), fungal infection (6.5), but it was better than that of patients with vitiligo (8.5), psoriasis (12.9) and urticarial (14.1). It was important to compare the DLQI results with the same ethnicity because Thailand is an Asian country and sometimes culture has an impact on the answers to questions such as feeling of embarrassment when they are asked about sex. In contrast to the result reported by Finlay and Khan[3], our study showed that men had higher scores than women on all items except item 10 (treatment). Although gender preference and psychological aspects have a great influence on quality of life, both sexes answered that they had the highest negative impact on symptoms/ feeling domain (pain and pruritus).

In conclusion, skin changes are frequently seen in patients with renal failure. Not only do they cause a high degree of morbidity, but are also very refractory to treatments. Our study clearly demonstrated that Thai ESRD patients who underwent MRD had a reduction in their quality of life. The clinical intensity of uremic xerosis and uremic pruritus was found to be significantly modeled in the deterioration in their quality of life. Therefore, more careful therapeutic management is needed to improve their quality of life. Although they are not generally life-threatening conditions, they can have important effects on the patients' physical health, psychological status, and social relations.

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