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ORIGINAL ARTICLE

Quality of Life Assessment in a Patient with Chronic Pruritus Undergoing Hemodialysis in Damietta Governorate

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Abstract

Background: **Chronic kidney disease (CKD) is an irreversible and slowly progressive disease. Patients with CKD commonly experience pruritus, especially those undergoing hemodialysis.**

Aim: **Identify the effect of uremic pruritis on the quality-of-life (QoL) of patients with CKD undergoing hemodialysis.**

Method: **This cross-sectional study included a sample size of 100 patients which was calculated with a power of 95%. We used three different tools for data collection; a structured interview Questionnaire, a 5-D Itching scale (5-D IS), and a Dermatology Life Quality Index (DLQI).**

Results: **Our study included 100 patients with CKD undergoing hemodialysis. The mean age of the patients was 48.18 ± 14.26yrs. 72% of the patients were males, and 28% were females. There was a significant association between the degree of pruritis and hemodialysis sessions, hemodialysis vintage, and degree of dermatology QoL index, *P*-value = 0.0001. Also, the length of pruritis and level of dermatology had a statistically significant correlation. QoL index, *P*-value = 0.0001. Additionally, there was a significant positive association ($r = 0.93$ and P value = 0.0001) between the QoL score and the pruritus score. Which means that the higher the value of the pruritis score the worse the QoL.**

Conclusion: **Uremic pruritus is a symptom that negatively affects QoL end-stage renal disease patients, and the clinician must consider this during the treatment of those patients.**

Keywords: Chronic kidney disease, Quality of life, Uremic pruritus

1. Introduction

Chronic kidney disease (CKD) is an irreversible and slowly progressive disease. It occurs secondary to major changes in the renal functions and renal structures for more than three months or secondary to less than 60 ml/1.73 m^2 of the glomerular filtration rate (GFR) for more than three months.[1] Major causes of CKD include Diabetes mellitus (DM), hypertension, and chronic pyelonephritis.[2] CKD may result in end-stage renal disease (ESRD), which will require dialysis or renal transplantation, and it may be complicated by heart disease up to death.[3]

Diagnostic criteria for CKD include; GFR less than 60 ml/1.73 m^2, markers of kidney damage such as; Albuminuria with albumin: creatinine ratio [ACR] greater than or equal to 30 mg/g, abnormal electrolyte due to tubular damage, and history of kidney transplantation, and Urinary sediment abnormality.[4]

Symptoms and signs of CKD include; Pallor, cognitive affection, Hypertension, Dyspnea, Anorexia, vomiting, uremic odor, polyuria, oliguria, hematuria, proteinuria, and skin affection in the form of peripheral edema and pruritis 4. Patients with CKD frequently have pruritus, especially those receiving hemodialysis.[5] The cause of uremic pruritis is still unknown. However, some authors suggested that it correlates with hemodialysis duration.[6]

Pathogenesis of pruritis might be multifactorial; calcium, magnesium salts, histamine, and parathormone played an essential role in pruritis

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development. Also, micro-inflammation and malfunctions in the opioid receptor are possible mechanisms for pruritus. A study examined these issues. Assessment of pruritis is complex, and there were multimethod for evaluation, but the 5-D itch questionnaire is the best to assess the pruritis as it is simple, only one page, easy to fill and to score either manually or electronically, and sensitive to multidimensional pruritis.[7] Multiple studies postulated that uremic pruritis affects CKD patients' quality of life (QoL), especially those undergoing hemodialysis.[8]

Dermatology Life Quality Index (DLQI) is used to assess the QoL of hemodialysis patients as it is simple and applicable to any patient with skin disease. This DLQI consists of 10 questions, each question has one answer from the following answers: not at all, a little, a lot, or very much, with the corresponding scores of 0, 1, 2, and 3, respectively. The not-relevant answer takes a score of 0. Then the score of each question is summed to other question scores to get the final score. The maximum value of the score is 30, which means that the quality of life is markedly impaired. We used this score.[9] So, this study aims to identify the effect of uremic pruritis on the QoL of patients with CKD undergoing hemodialysis.

2. Patients and method

2.1. Study populations

This cross-sectional study included a sample size of 100 patients which was calculated with a power of 95%. Our study followed the guidelines of the Helsinki Declaration. We obtained the informed consent from the patients. Our information was kept private. The patients were chosen based on the following:

The Inclusion Criteria include 1) Patient with CKD undergoing hemodialysis. 2) Willing to participate in the study. 3) Able to communicate. 4) Complaints at least 3 times of itching at 2 weeks or more. 5) complained of itching regularly and was diagnosed during 6 months.

The Inclusion Criteria include: patients with underlying skin diseases or any other secondary causes of pruritus such as paraneoplastic pruritus.

2.2. Data collection

We used three different tools for data collection.

Tool I is a structured interview Questionnaire that consists of two sections; the first section includes, the demographic characteristics of the subjects such as age, residence, sex, education, occupation, marital status, work nature, and income. The second section includes; clinical data of the patients as the onset of renal failure, the disease duration, the disease etiologies, presence of other diseases, date of starting dialysis, number of sessions per week, duration of hemodialysis, and complications.

Tool II; 5-D Itching scale (5-D IS); consists of five domains that can determine itching's duration, degree, direction, disability, and distribution. The disability includes the following subdomains; sleep, social activities, housework activities, and work/school. Scores of 5-D Itching scale range from 5 which means no pruritus up to 25 which means severe pruritus.

Tool III; is the DLQI. This questionnaire consists of 10 questions, and each question is scored 0 to 3; not relevant or not at all is scored 0, a little is scored 1, a lot is scored 2, and very much is scored 3. The final score is by summing each question score. The maximum score value which means bad QOL equal to 30 and the minimum score value which means good QOL equal to 0.

2.3. Statistical analysis

SPSS version 25 was used for all statistical analysis (IBM Corp., Armonk., NY., USA). Categorical variables were displayed as percentages and integers. If they were distributed normally, we presented them with mean and standard deviations. We provided continuous data as median and interquartile range if they were not regularly distributed. The χ^2test was used to determine the association between the two variables. Spearman's correlation analysis was done to detect the correlation between the Dermatology QoL score and Pruritis score.

3. Results

Our study included 100 patients undergoing hemodialysis. Table 1 shows the demographic characteristics of the patients. The age of studied patients ranged from 21 up to 76 years, with a mean age of 48.18 ± 14.26yrs. As regards gender, 72% of the patients were males, and 28% were females. About 68% of the patients were married, and 32% were unmarried.

70% of our patients were from rural areas, and 30% were from urban areas. It was observed that 47% of our patients had renal failure due to DM, 21% due to hypertension, and 32% due to other causes.

Table 2 shows the distribution of the patients according to their duration, degree, and direction of

Table 1. Demographic characteristics of the patients with pruritis undergoing hemodialysis.

Items	$N = 100$ (%)
Sex	
Male	72 (72)
Female	28 (28)
Marital state	
Married	68 (68)
Not married	32 (32)
Place of residence	
Rural	70 (70)
Urban	30 (30)
Income	
Enough	50 (50)
Not enough	50 (50)
Employment	
Employed	40 (40)
Not employed	60 (60)
Hemodialysis Vintage	
<1 year	26 (26)
1–3 years	46 (46)
3–5 years	20 (20)
>5 years	8 (8)
Hemodialysis sessions	
Two/week	15 (15)
Three/week	85 (85)
Cause of renal failure	
Diabetes Meletus	47 (47)
Hypertension	21 (21)
Other causes	32 (32)
Age	
Median and IQR	50 (37–59.75)
Range	(21–76)
Mean ± SD	48.18 ± 14.26

pruritus. It was observed that 49% of the studied patients suffered from pruritus for less than 6 h in the last two weeks and only 4% still suffer pruritic episodes all day.

Table 2. Distribution of the patients according to duration, degree and direction of pruritus during the last 2 weeks.

Items	$N = 100$ (%)
Duration	
<6 h	49 (49)
6–12 h	30 (30)
12–18 h	9 (9)
18–23 h	8 (8)
All day	4 (4)
Degree	
Not present	2 (2)
Mild	45 (45)
Moderate	37 (37)
Sever	13 (13)
unbearable	3 (3)
Direction	
Completely resolved	4 (4)
Much better, but still present	32 (32)
Little better, but still present	30 (30)
Unchanged	27 (27)
Getting worse	7 (7)

Table 3. Distribution of the patients according to the effect of pruritus on their disability.

Items	$N = 100$ (%)
Sleep	
Never affects sleep	60 (60)
Occasionally delay falling asleep	0 (0)
Frequently delay falling asleep	24 (24)
Delays falling asleep and occasionally wakes me up at night	10 (10)
Delays falling asleep and frequently wakes me up at night	6 (6)
Activities of daily living	
Never affect	30 (30)
Rarely affect	36 (36)
Occasionally affect	15 (15)
Frequently affect	9 (9)
Always affect	10 (10)
Activity and Social contact	
Never affect	31 (31)
Rarely affect	0
Occasionally affect	50 (50)
Frequently affect	9 (9)
Always affect	10 (10)
Effect on work or school	
Never affect	40 (40)
Rarely affect	26 (26)
Occasionally affect	18 (18)
Frequently affect	11 (11)
Always affect	5 (5)

Regarding the degree of pruritus, it was observed that 45 had mild pruritis and 37% had moderate pruritis, and 13% had severe pruritus. According to pruritus direction, 32% of the patients were described as much better, but still present, while 30% were described as a little better, but still present, 27% unchanged, and 7% getting worse.

Table 3 shows the distribution of the patients according to the effect of pruritus on their disability. It was observed that pruritus never affects sleep in

Table 4. Distribution of the patients according to the distribution of pruritus on body parts.

Body parts	N (%)
Abdomen	41 (41)
Back	38 (38)
Toes	43 (43)
Arm	38 (38)
Fingers	30 (30)
Head	35 (35)
Chest	28 (28)
Legs	24 (24)
Waist	23 (23)
Perinium	22 (22)
Thigh	21 (21)
Forearm	17 (17)
Buttock	14 (14)
Hands	13 (13)
Face	12 (12)
Feet	10 (10)

60% of the included patients while occasionally affecting the social activity of 50% of included patients.

Table 4 shows the distribution of the patients according to the distribution of pruritus on body parts. It was noticed that the most affected body parts by pruritus were the toes 43%, abdomen 41%, and back 38%.

Significant associations were detected between the degree of pruritis and hemodialysis sessions, hemodialysis vintage, and degree of dermatology QoL index, P value = 0.0001. Also, there was a statistically significant association between duration of pruritis and degree of dermatology QoL index, P value = 0.0001.

Fig. 1 shows a correlation between pruritus score and dermatology QoL. It was observed from this figure that there was a strong positive correlation between QoL score and pruritus score r = 0.93 and P value = 0.0001.

4. Discussion

Our study included 100 patients undergoing hemodialysis with a mean age of 48.18 ± 14.26 years. Increasing the patient ages agree with Prakash and O'Hare[10] who suggested that age is a risk factor for CKD. This was in accordance with a study done in Europe, by Pippiaset and colleagues[11] who found that the mean age of patients on dialysis was 62.0 years.

As regards sex, we found that 72% of included patients were males, this is in accordance with Guerra-Guerrero and colleagues[12] who reported that the predominant patients were males. This finding disagrees with Carrero and colleagues[13] who suggested that CKD is more prevalent in women than men and disagrees with Kursewicz and colleagues[14] who found that the degree of chronic pruritis is significantly greater in females than males ($P < 0.05$).

This difference between males and females may be explained by their difference in renal structure Silbiger and Neugarten.[15] In relation to place of residence, our study shows that 70% of the included patients live in rural areas which is supported by a study done by Stanifer and colleagues[16] who found that chronic renal disease seems to be more prevalent in rural regions compared with urban areas.

Prevalence of the cases in rural areas may be due to the high frequency of well-known clinical and socio-demographic risk factors for chronic renal failure occurrence and progression to end-stage renal disease.

This disagrees with the finding of El-Shahed and colleagues[17] who reported that around two-thirds of their studied hemodialysis patients were living in an urban area. As regards economic status about 50% of patients were low economic state. It could be due to the financial burden of the disease associated with decreased income after retirement and costly treatment.

DM and hypertension were the major causes of renal failure in our sample by a percentage of 68%, This result is consistent with the result of Lee and colleagues[18] However, we found that 47% of the patient had CKD following DM which agree with the result of 2012 atlas of CKD in USRDS[19] which suggested that DM is leading cause of CKD.

As regards hemodialysis sessions, we found that 85% of our patients underwent hemodialysis three

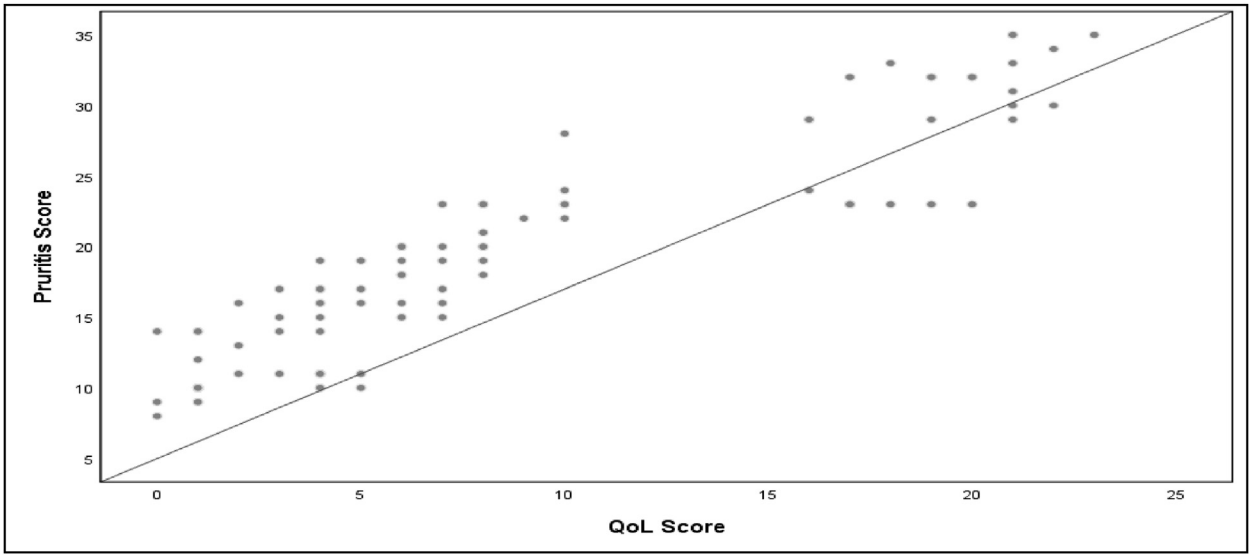

Fig. 1. Spearman's correlation analysis shows strong positive correlation between Dermatology QoL score and Pruritis score.

times per week, and only 15% underwent hemodialysis two times per week. This may be due to that they thought an increasing number of hemodialysis sessions will improve the residual kidney function, however, this disagrees with the result of Zhang and colleagues[20] who found that Twice-weekly hemodialysis in the first year of hemodialysis was better than thrice weekly hemodialysis in preserving the residual kidney function.

Uremic pruritus (UP) is a distressing complication that affects QoL of the patient undergoing hemodialysis Susel and colleagues.[6] As regards the duration of pruritis We found that the largest percentage of patients suffered from pruritus for less than 6 h, and the smallest percentage still suffered pruritic episodes all day in the last two weeks before the assessment, which agrees with the result of Takahashi and colleagues[21] However, we cannot identify which time in the day the pruritis appear, while a study was done by Malekmakan and colleagues[22] who found that the pruritis occurs at night.

In relation to the degree of pruritis 45% of the patients had mild pruritis in the last two weeks, 37% had moderate pruritis and 13% had severe pruritis. This result is in accordance with the result of Li and colleagues[23] and in contrast with a study done by Akhyani and colleagues.[24]

As regarding to the direction of pruritis 32% of the patients described it as much better but still present, however, 7% of the patient described it as getting worse which disagree with Malekmakan and colleagues[22] who found that one-fifth of the patient had to wound themselves due to scratching and one-fifth of the patients getting worse. This contrast in findings may be due to that the assessment of pruritis by a subjective method is difficult and may result in a difference between the outcome assessors.

As regards sleep disturbance, we found that 40% of our patient had sleep disturbance following pruritis which agree with the result of Takahashi and colleagues.[21] This explains the fact that uremic pruritis was considered to be an independent predictor of poor QoL. In relation to the distribution of pruritis on the body parts, we found that the most common sites affected by uremic pruritis are extremes, head, chest, and back, which agrees with Zhao and colleagues.[25]

A significant association was found between the duration of pruritis and the degree of QoL, in which when the duration of pruritis increased, the degree of QoL worsened (P value < 0.0001). Also, we found a significant association between the degree of pruritis and the degree of dermatology QoL index (P -value <0.0001), this result agrees with Ibrahim and colleagues.[26]

Our study gives us evidence that there is a strong positive correlation between QoL score and pruritus score r $= 0.93$ and P value $= 0.0001$. This positive correlation means that the higher the value of the Pruritis score the worse the QoL. So, we can improve the QoL of those patients by prevention and early treatment of this pruritis. This finding in accordance with another study conducted by Li and colleagues[23] who found correlations existing between pruritus, sleep quality, and depressive symptoms in dialysis patients, and also agree with Mathur and colleagues[27] who found that itching severity was significantly associated with lower health related QoL.

Limitations of our study include; a small sample size; it was a single-arm cross-sectional study that did not show the causal association between different variables, so we recommend that future researchers should do a multicenter prospective cohort study with larger sample size. Another limitation of our study is that the number of cases with severe pruritis was small ($n = 13$), so readers may be unable to identify a meaningful relationship between QoL and severe pruritis. So, we need further studies with a larger sample size to present this association as well. Finally, the difference in the cultural and educational levels of the patients affected their answers which affected the final score. So, we recommend that future researchers should interview each patient during data collection to explain the meaning of each question before answering.

In conclusion, uremic pruritus is a symptom that negatively affects QoL in patients with end-stage renal disease, and the clinician must consider this during the treatment of those patients.

Author contributions

All authors contributed to the conception and design, acquisition of data, analysis, draft manuscript preparation and interpretation of data. All authors reviewed the results and approved the final version of the manuscript.

Disclosure

The authors have no financial interest to declare in relation to the content of this article.

Authorship

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Conflict of Interest

The authors declared that there were No conflicts of Interest.

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