The association between CKD-associated pruritus and quality of life in patients undergoing hemodialysis presenting to nephrology division, Khyber teaching hospital Peshawar

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Abstract—Background and Aim: Chronic kidney disease-associated pruritus (CKD-aP), commonly known as uremic pruritus is a frequent and inconvenient disease for patients undergoing hemodialysis. The purpose of the present investigation was to determine the association of CKD-associated pruritus with quality of life in patients undergoing hemodialysis presented to the nephrology division of Khyber Teaching Hospital.
Hospital Peshawar. Patients and Methods: This cross-sectional study was conducted on 227 CKD-associated pruritus patients investigated in the Nephrology Division of Khyber Teaching Hospital Peshawar from March 2022 to February 2023. Patients of either gender (>18 years) undergoing hemodialysis were enrolled. Demographic details, dialysis duration, duration of disease, and various comorbidities conditions were recorded based on a pre-designed questionnaire.

Results: Out of 227 patients, there were 142 (62.6%) male and 85 (37.4%) female. The overall mean age was 40.82±6.82 years. The incidence of CKD-associated pruritus was 68.7% (n=156). The presence of various comorbidities such as diabetes mellitus, hypertension, hyperlipidemia, and cardiovascular disease was found in 30 (13.2%), 124 (54.6%), 16 (7.0%), and 6 (2.6%) respectively. The overall mean duration of CKD and duration on hemodialysis was 34.4 [12.0–48.0] months and 22.8 [12.0–36.0] months respectively.

Conclusion: The incidence of CKD-associated pruritus was 68.7%, and had a detrimental impact on the QOL. A lower QoL was found in patients suffering from moderate or severe pruritus. The QOL score of hemodialysis patients dropped as the degree of their pruritus increased.

**Keywords**—hemodialysis, CKD-associated pruritus, quality of life (QOL), nephrology.

**Introduction**

Chronic kidney disease-associated pruritus (CKD-aP) is a common and bothersome disease for hemodialysis individuals. Chronic kidney disease usually has pruritus as a frequent and unpleasant symptom that has a detrimental influence on their quality of life (QOL) [1]. The incidence of CKD-aP has been shown to vary substantially between investigations. It has been stated that it can range between 20% and 90% [2, 3]. The CKD-aP is a prevalent, troublesome, and undertreated symptom in patients undergoing hemodialysis (HD) [4]. The fact that pruritus has no association with phosphate, urea, and other uremic toxins has developed new CKD-aP nomenclature [5]. A previous study reported that poor sleep quality, decreased HRQoL, sadness, and higher mortality are various factors related to the severity of pruritus [6]. As CKD-aP treatments, a variety of strategies have shown various degrees of efficacy [7].

The incidence of CKD-aP in CKD individuals varies from 18% to 97% [8, 9]. CKD-related metabolic changes such as hyperparathyroidism, uremic sensory neuropathy, hypophosphatemia, transdermal mast cell proliferation, Xerosis, hypercalcemia, and increased amounts of histamine have all been associated with CKD-aP intensification [10]. Chronic pruritus dramatically reduces the CKD patients QOL by negatively impacting their physical, psychological, social, and functional well-being [11]. All of this contributes to daytime weariness, depressed symptoms, and sleeplessness [12, 13]. According to a previous research, pruritus is connected with a greater risk of mortality in CKD patients [14]. The prolonged treatment of CKD-aP causes lack of control and personal autonomy that adversely
impact the QOL [15]. Treating CKD-associated pruritus is difficult since it is frequently resistant to oral antihistamines and centrally acting medicines like Gabapentin. As a result, it is critical to have a knowledge of the variables related with severity of CKD-associated pruritus. Therefore, the present study was carried out to determine association of CKD-aP with QOL in patients undergoing hemodialysis presented to the nephrology division of Khyber Teaching Hospital Peshawar.

**Methodology**

This cross-sectional study was conducted on 227 CKD-associated pruritus patients investigated in the Nephrology Division of Khyber Teaching Hospital Peshawar from March 2022 to February 2023. Patients of either gender (>18 years) undergoing hemodialysis were enrolled. Demographic details, dialysis duration, duration of disease, and various comorbidities conditions were recorded based on a pre-designed questionnaire. A prior study indicated that 18% of people with CKD have pruritus [9]. The needed sample size was 227 (with a 95% level of confidence). Patients were contacted while receiving hemodialysis. The study’s purpose was conveyed to them. Patients who agreed to participate completed a written informed consent form. The medical history and demographic details included ESKD etiologies, anti-pruritic therapy, gender, and age. All patients in the trial had their laboratory factors impacting pruritus tested, including hemoglobin, albumin, calcium, phosphorus, and parathyroid hormone levels. SPSS version 27 was used for data analysis. The Pearson chi-square test was used to analyze associations between categorical variables, and the Mann-Whitney U test was used to assess associations between continuous variables. Multivariate linear analysis was performed on the variables by taking P-value 0.05 as a significant level and 95% confidence interval.

**Results**

Of the total 227 patients, there were 142 (62.6%) were male and 85 (37.4%) were female. The overall mean age was 40.82±6.82 years. The incidence of CKD-associated pruritus was 68.7% (n=156). The presence of various comorbidities such as diabetes mellitus, hypertension, hyperlipidemia, and cardiovascular disease was found in 30 (13.2%), 124 (54.6%), 16 (7.0%), and 6 (2.6%) respectively. The overall mean duration of CKD and duration on hemodialysis was 34.4 [12.0–48.0] months and 22.8 [12.0–36.0] months respectively. Table-I represent the demographic details of all the patients. The incidence of various comorbidities are illustrate in Figure-1. The incidence of mild, moderate, and severe pruritus was 34.6% (n=54), 56.4% (n=88), and 9% (n=14) respectively as depicted in Figure-2. A significant association of CKD-aP with various parameters such as patient’s age, duration of CKD, QOL, and HR-QOL were seen on multivariate regression analysis as shown in Table-II.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>40.82±6.82</td>
</tr>
</tbody>
</table>

Table I
Demographic details of patients
<table>
<thead>
<tr>
<th>Gender N (%)</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>142 (62.6)</td>
<td>85 (37.4)</td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Mean duration of CKD (months) | 34.4 [12.0–48.0] |
| Mean duration of hemodialysis (months) | 22.8 [12.0–36.0] |

**Figure 1. Comorbidities**

**Figure 2. Severity of pruritus (N=156)**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Multivariate analysis</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient’s age (years)</td>
<td>(b=0.029; 95% CI=0.001-0.061)</td>
<td>0.036</td>
</tr>
<tr>
<td>CKD duration (months)</td>
<td>(b=0.012; 95% CI=0.022-0.002)</td>
<td>0.012</td>
</tr>
<tr>
<td>*QOL</td>
<td>(b=0.896; 95% CI=1.450)</td>
<td>0.452</td>
</tr>
<tr>
<td>Health related QoL</td>
<td>51.00 [42.00-58.00].</td>
<td>0.003</td>
</tr>
</tbody>
</table>

*QOL: Quality of Life
Discussion

The present study mainly focused on the CKD-aP association with QOL in patients undergoing hemodialysis and found that the incidence of CKD-aP was 68.7% and had adverse effects on QOL. A lower QoL was found in patients suffering from moderate or severe pruritus. The QOL score of hemodialysis patients dropped as the degree of their pruritus increased. CKD-associated pruritus is a bothersome and common symptom among advanced CKD patients. According to studies, the incidence varies widely between countries and even between cities within the same country. Pathogenesis is associated with a multitude of risk factors, many of which are unknown. The recurrence and persistence of pruritus is usually bilaterally symmetrical and had significant impact on limbs, trunk with no skin lesion's initiation, and become worsen at night. CKD-aP has a major influence on the patient’s QOL, negatively impacting their social life and sleep quality [16-19].

About 56.4% of the 532 HD patients recruited from nine institutions reported moderate pruritus, and the impact of pruritus on sleep, HRQoL, hospitalization, and mortality was investigated [20]. In the pilot research, the incidence of moderate and severe pruritus was 50% and 14% respectively [21]. The pruritus was more severe in male patients than females. These findings resemble the previous research results [22]. Patients underwent ultrafiltration of their choosing while talking with dialysis professionals outside of the conventional protocol, resulting in poor dialysis. The dialysis equipment was limited in our research, and inadequate dialysis was caused by pressure from too many patients. Similar studies by Adhikari et al revealed the same problem of growing patient numbers and insufficient hemodialysis equipment [23]. The dialysis’s increased frequency and duration improve the QOL of individuals, which reduces their odds of death [24].

In this investigation, CKD-aP association with patient’s age was found significant which is consistent with the results of earlier investigations according to which pruritus severity was significantly associated with patient’s age [25, 26]. In contrast, few studies reported no significant association between CKD-aP and patient’s age [27, 28]. Furthermore, the present study reported a significant association of CKD-aP with CKD duration. In contrast, another study reported no significant association of CKD-aP with serum calcium, diabetes, hyperphosphatemia, and hypertension [29, 30]. Takahashi et al. [31] reported that individual QOL in terms of symptoms, social life, and mood declined by the pruritus.

Conclusion

The incidence of CKD-associated pruritus was 68.7%, and had a detrimental impact on the QOL. A lower QoL was found in patients suffering from moderate or severe pruritus. The QOL score of hemodialysis patients dropped as the degree of their pruritus increased.
References