Impact of pruritus on patient fatigue: a case-control study

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Background: Pruritus, either as a chronic standalone disease or secondary to inflammatory skin disease, can have a very detrimental effect on the overall quality of life for patients suffering from intense itch, particularly on patients suffering from atopic dermatitis. Symptoms of itching have a reported association with worsened quality of life across various psychological and social domains, including fewer periods of rest and reduced sleep quality. While prior studies have been made to determine the relationship between both fatigue and pruritus combined on systematic disease severity, there is limited data on how the prevalence of pruritus directly correlates with the prevalence of fatigue.

Objective: We utilized the AoU database to perform a nested case-control study to determine the impact of pruritus on patient-reported fatigue.

Methods: Within this database, patients experiencing pruritus (chronic pruritus, chronic pruritus of unknown origin (CPUO), prurigo nodularis, psoriasis, and atopic dermatitis) were identified and matched to four controls using nearest neighbor propensity-score matching, with sex, age, and race/ethnicity. Comparative analyses between pruritus cases and controls were performed utilizing the Fisher’s exact test for categorical variables and the unpaired t-test for continuous variables. Logistic regression models were developed to calculate the odds ratio (OR) of having pruritus (SNOMED: 279333002, ICD10CM-L29), and developing fatigue (SNOMED: 84229001, ICD10CM-R53.83), with covariates including age, race/ethnicity, sex, income, education, anxiety, and depression. A significance level was set at P<0.05, and 95% confidence intervals were developed using the Wald method.

Results: From the cohort with accessible electronic health records (EHR) in 91,212 controls and 22,803 cases of pruritus were identified (mean age 59.91 [standard deviation: 15.95], 63.57% female). Patients afflicted with pruritus demonstrated a noticeably elevated prevalence of fatigue (40.81%) compared to the control group (22.06%). After adjusting for demographics and other covariates in multivariable analysis, chronic pruritus remained significantly associated with fatigue, with a multivariable adjusted
odds ratio (aOR) of 1.56 (95% CI 1.16-2.07), as indicated in Table I. In-depth analysis revealed that specific pruritic conditions exhibited strong associations with fatigue, namely, CPUO (aOR 2.27, 95% CI 1.35-3.82), prurigo nodularis (aOR 2.21, 95% CI 1.87-2.61), and atopic dermatitis (aOR 2.05, 95% CI 1.97-2.13).

Conclusion: Our study provides a quantitative measure of pruritus’ impact on the prevalence of patient-reported fatigue across many pruritic conditions, including atopic dermatitis. This two-fold increase in fatigue in patients with itch further emphasizes the clinical importance of understanding the impact of pruritus on patient quality of life.

Table I. Univariable and multivariable-adjusted odds of fatigue in patients with pruritus and pruritus-related conditions

<table>
<thead>
<tr>
<th>Disease</th>
<th>Univariable OR (95% CI)</th>
<th>P value</th>
<th>Multivariable aOR (95% CI)†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pruritus/Pruritus-related conditions*</td>
<td>2.44 (2.36, 2.51)</td>
<td>&lt;0.001</td>
<td>1.93 (1.87, 1.99)</td>
</tr>
<tr>
<td>Chronic pruritus</td>
<td>2.29 (1.76, 2.96)</td>
<td>&lt;0.001</td>
<td>1.56 (1.16, 2.07)</td>
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<tr>
<td>CPUO</td>
<td>3.23 (2.02, 5.18)</td>
<td>&lt;0.001</td>
<td>2.27 (1.35, 3.82)</td>
</tr>
<tr>
<td>Prurigo nodularis</td>
<td>3.03 (2.60, 3.52)</td>
<td>&lt;0.001</td>
<td>2.21 (1.87, 2.61)</td>
</tr>
<tr>
<td>Psoriasis</td>
<td>2.02 (1.91, 2.13)</td>
<td>&lt;0.001</td>
<td>1.62 (1.53, 1.71)</td>
</tr>
<tr>
<td>Atopic dermatitis</td>
<td>2.57 (2.48, 2.66)</td>
<td>&lt;0.001</td>
<td>2.05 (1.97, 2.13)</td>
</tr>
</tbody>
</table>

aOR: multivariable adjusted odds ratio, CI: confidence interval, CPUO: chronic pruritis of unknown origin
*Includes participants with chronic pruritis, CPUO, prurigo nodularis, psoriasis, and atopic dermatitis
†aOR: Multivariable regression analysis controlled for age, race, ethnicity, sex, income, education, anxiety, and depression.
SNOMED/ICD diagnostic codes: Chronic pruritus (4302654 for patients> 6 weeks, L29); CPUO (L29.9); prurigo nodularis (63501000, L28.1); psoriasis (9014002, L40); atopic dermatitis (24079001, L20); fatigue (84229001, R53)

Keywords: atopic dermatitis, itch, pruritus, fatigue
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