Concomitant sleep disorder significantly increased the risk of cardiovascular disease in patients with psoriasis

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Background

- Psoriasis, a systemic inflammatory disorder, is associated with a variety of medical comorbidities.
- Both psoriasis and sleep disorder (SD) are associated with cardiovascular disease (CVD).
- However, how SD modifies the risk of CVD in psoriasis remains unknown.

Objectives

- To evaluate the impact of sleep disorder on CVD development in patients with psoriasis

Study Design

- We used the Taiwan’s National Health Insurance Research Database (NHIRD) to conduct a retrospective cohort study. This database covered 99% of nearly 23 million people from 2003 to 2011.
- The index date was defined as the date of first diagnosis of psoriasis.
- In order identify the SD that was strongly associated and occurred concomitantly with psoriasis, we defined concomitant SD as the development of SD within 6 months after the diagnosis of psoriasis
- The primary outcomes for the analysis were ischemic heart disease (ICD-9 codes: 410-414) or stroke (ICD-9 codes: 430-438).

Study Population

**Inclusion criteria**

Patients who
1) Aged 18 years older
2) Had at least one outpatient visit or admission claim with an ICD-9-CM code for psoriasis (696.0 for psoriatic arthropathy or 696.1 for psoriasis) from 2004 to 2010

**Exclusion criteria**

1) Those with a diagnosis of ischemic heart disease (IHD) (ICD-9 codes: 410-414), stroke (ICD-9 codes: 430-438), sleep disorder (ICD-9 codes: 780.52, 307.41, 307.42, 780.51, 780.53, and 780.57) one year prior to the index date
2) Those with missing sex and age information, and subjects who were less than 18 years old.
3) Patients with a diagnosis of SD more than 6 months after index date.

**Subgroups of patients with psoriasis**

Psoriasis was defined as severe if patients received systemic anti-psoriatic treatments and/or phototherapy (e.g. phototherapy, acitretin, methotrexate, methoxsalen, cyclosporine, azathioprine, hydroxyurea, mycophenolate mofetil, etanercept, or adalimumab) and mild if they did not.

Statistic Analysis

- The Cox proportional hazards model with propensity score weighting was applied to estimate the hazard ratios (HR) for the risk of IHD and stroke in patients with and without SD.
- We also adjusted for potential confounders in the multivariable Cox models.

Results

Table 1: Hazard ratio for the risk of cardiovascular disease in psoriasis patients with sleep disorder compared to psoriasis patients without sleep disorder.

<table>
<thead>
<tr>
<th></th>
<th>Crude HR</th>
<th>(95 % CI)</th>
<th>P-value</th>
<th>Adjusted HR* (ATE)</th>
<th>(95 % CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outpatient or inpatient</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ischemic heart disease or acute stroke</td>
<td>1.77</td>
<td>(1.60-1.95)</td>
<td>&lt;0.001</td>
<td>1.38</td>
<td>(1.34-1.41)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ischemic heart disease</td>
<td>1.77</td>
<td>(1.59-1.96)</td>
<td>&lt;0.001</td>
<td>1.25</td>
<td>(1.22-1.28)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Stroke</td>
<td>1.74</td>
<td>(1.34-2.25)</td>
<td>&lt;0.001</td>
<td>1.24</td>
<td>(1.16-1.33)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hospitalization for CVD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ischemic heart disease or acute stroke</td>
<td>1.54</td>
<td>(1.26-1.87)</td>
<td>&lt;0.001</td>
<td>1.06</td>
<td>(1.01-1.11)</td>
<td>0.03</td>
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<tr>
<td>Ischemic heart disease</td>
<td>1.61</td>
<td>(1.31-1.98)</td>
<td>&lt;0.001</td>
<td>1.02</td>
<td>(0.96-1.07)</td>
<td>0.55</td>
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<tr>
<td>Stroke</td>
<td>1.45</td>
<td>(0.98-2.14)</td>
<td>0.06</td>
<td>0.94</td>
<td>(0.85-1.04)</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Abbreviation: HR: Hazard ratio; CI: confidence interval; CVD: cardiovascular disease.

Table 2: The association between the dosage of hypnotic drug use and the risk for cardiovascular diseases among psoriasis patients with sleep disorder.

<table>
<thead>
<tr>
<th>Dosage of hypnotic drug</th>
<th>Adjusted HR* (ATE)</th>
<th>(95 % CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>1.00</td>
<td></td>
<td></td>
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<tr>
<td>Medium</td>
<td>1.68</td>
<td>(1.61-1.75)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>High</td>
<td>2.01</td>
<td>(1.93-2.09)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Abbreviation: HR: Hazard ratio; CI: confidence interval

References