Potential population impact of antidepressant use on hip fractures rate in Denmark (DK), Norway (NO) and the Netherlands (NL).

Jennifer SB Goldenberg, Hans Petri, Phuong T Khong, Olaf H Klungel and Frank de Vries

Background:
The use of antidepressants has been associated with an increased hip fracture risk in observational studies. However, the potential impact of antidepressant consumption on the population rate of hip fractures has not been estimated.

Objectives:
To evaluate the population impact of antidepressant use on the rate of hip fractures using publicly accessible drug utilization databases. This study was conducted as part of the IMI PROTECT Study (Drug Utilization).

Methods:
National consumption data of antidepressants were obtained from publicly accessible databases, including the Danish Medicines Agency National consumption data of antidepressants were obtained from publicly accessible databases, including the Danish Medicines Agency and the Norwegian Institute of Public Health (2008). In each country, one-year prevalence rates (Pes) were calculated with numbers of antidepressant users and population numbers from public sources.

Formula 1 was used for the calculation of the population attributable risk (PAR) of antidepressant use.

\[ PAR = \frac{PR(\text{RR} - 1)}{1 + PR(\text{RR} - 1)} \times 100 \]

Results:
Relatively small differences in antidepressant consumption were observed between DK (7.4%), NO (3.7%) and NL (3.2%). Selective serotonin reuptake inhibitors were the most frequently used classes of antidepressants in each country (Pes: DK 5.2%, NO 3.7% and NL 3.2%). A 1.7-fold increased hip fracture risk was estimated among antidepressant users, as compared to non-users (pooled RR: 1.7; 95% CI 1.47-1.98; case-control studies 1.75 [1.48-2.06]; cohort studies 1.45 [1.05-2.02]).

A 1.7-fold increased hip fracture risk was estimated among antidepressant users, as compared to non-users (pooled RR: 1.7; 95% CI 1.5-2.0), based on 11 observational studies (4 cohort, 7 case-control). PAR estimates ranged from 1.9% (95% CI 2.7%-5.4%) in the NL to 4.9% (95% CI 3.4%-6.8%) in DK.

PooledRRs were estimated using a random effects model. Together with Pes, population attributable risks (PARs) of antidepressant use to hip fractures were estimated.

Conclusions:
These findings suggest that the potential attribution of antidepressant use to the population rate of hip fractures in three different EU countries varies between 4% and 5%.

References:

Figure 1. Forest plot examining the association between antidepressant use and hip fracture risk, assuming a random effects model.

Table 1. Antidepressant consumption expressed as one-year prevalence rates (Pes) in %

<table>
<thead>
<tr>
<th>Country</th>
<th>Total SSRI</th>
<th>Total TCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>7.41</td>
<td>2.34</td>
</tr>
<tr>
<td>Netherlands</td>
<td>5.79</td>
<td>3.20</td>
</tr>
<tr>
<td>Norway</td>
<td>6.09</td>
<td>3.74</td>
</tr>
</tbody>
</table>

Note: SSRI = selective serotonin reuptake inhibitor; TCA = tricyclic antidepressant.

Table 2. Estimated population impact of antidepressant consumption on the rate of hip fractures expressed as population attributable risks (PARs) in % (95% confidence interval)

<table>
<thead>
<tr>
<th>Country</th>
<th>All studies</th>
<th>Case-control studies</th>
<th>Cohort studies</th>
</tr>
</thead>
</table>

PARRs were estimated with formula 1 using both pooled RRs (Table 1: 1.70 [1.47-1.96]; case-control studies 1.75 [1.48-2.06]; cohort studies 1.45 [1.05-2.02]) and one-year prevalence rates of antidepressant consumption (Table 1: total antidepressant consumption).

Corresponding authors: j.s.b.goldenberg@students.uu.nl j.devis@uu.nl

Division of Pharmacoeconomics and Clinical Pharmacology

Facility of Science
Pharmaceutical Sciences
UIP, Utrecht University, Utrecht, Netherlands

© University of Utrecht

Division of Pharmacoepidemiology and Clinical Pharmacology