Potentially inappropriate medicines and potential prescribing omissions in older people and their association with health care utilization: a retrospective cohort study

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Introduction
Older people are particularly vulnerable to adverse effects of prescribed drugs1. In response to these concerns, prescribing indicators have been developed addressing: Potentially Inappropriate Medicines (PIMs), medicines prescribed without an indication or with an unfavourable risk-benefit ratio, and Potential Prescribing Omissions (PPOs), omissions of clinically indicated medicines with a clear benefit. Little is known about the impact of PIMs and PPOs on healthcare utilization2. This study aims to determine the prevalence of PIMs and PPOs in a cohort of older people and their association with healthcare utilization.

Methods

Study design
• This was a retrospective cohort study of 2,051 community-dwelling participants in Wave 1 of The Irish Longitudinal Study on Ageing (TILDA) aged ≥65 years with linked medication dispensing history from a national pharmacy claims database.
• TILDA is a representative cohort of over 8,000 people resident in Ireland aged ≥50 years charting their health, social and economic circumstances.
• Medication data, classified by WHO Anatomical Therapeutic Chemical codes, was obtained from the Health Services Executive Primary Care Reimbursement Services (HSE-PCRS) pharmacy claims database, which details monthly medications dispensed to persons eligible for the General Medical Services (GMS) scheme in Ireland.

Exposure
Exposure to PIMs and PPOs was determined in the 12 months preceding each participant’s TILDA interview using the Screening Tool for Older Persons’ Prescriptions (STOPP), Beers criteria4, Assessing Care Of Vulnerable Elders (ACOVE) indicators5 and the Screening Tool to Alert doctors to Right Treatment (START)6. Some indicators could not be applied due to lack of participant clinical information – Figure 1 shows the proportion of included criteria from each screening tool.

Outcome
As part of the TILDA interview, participants were asked about their healthcare utilization for a range of primary care and secondary care services in the previous 12 months. The outcome measures used for this study were self-reported number of hospital visits (emergency department of inpatient admissions) and number of general practitioner (GP) visits.

Data analysis
Poison regression was used to determine the association between exposure to PIMs and exposure to PPOs and the rate of hospital and GP visits, adjusting for age, sex, education level, number of regular medications and chronic conditions and health insurance status. Separate models were fitted for each PIM and PPO screening tool and each of the two outcomes. Number of medications and chronic conditions were reported by participants during their TILDA interview. Analysis was performed using STATA version 12.

Results

Overall prevalence
• The percentage of participants with a PIM during the study period was 19.8–52.7% depending on screening tool used while PPO prevalence varied from 43.6–44.8% (Table 1).
• The number of PIMs and PPOs identified were 2,963 and 2,515, respectively.
• In total, 803 participants (39.2%) had both a PIM and PPO.

Table 1. Prevalence of PIMs and PPOs by screening tool
<table>
<thead>
<tr>
<th>Screening tools</th>
<th>Participants with PIM</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>STOPP criteria</td>
<td>1,081</td>
<td>52.7</td>
<td></td>
</tr>
<tr>
<td>Beers criteria</td>
<td>625</td>
<td>30.5</td>
<td></td>
</tr>
<tr>
<td>ACOVE indicators</td>
<td>407</td>
<td>19.8</td>
<td></td>
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<tr>
<td>Any above PIM</td>
<td>1,260</td>
<td>61.4</td>
<td></td>
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<tr>
<td>START criteria</td>
<td>895</td>
<td>43.6</td>
<td></td>
</tr>
<tr>
<td>ACOVE indicators</td>
<td>918</td>
<td>44.8</td>
<td></td>
</tr>
<tr>
<td>Any above PPO</td>
<td>1,167</td>
<td>56.9</td>
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</tbody>
</table>

Conclusion
Exposure to PIMs and PPOs is independently associated with increased rate of hospital visits and GP visits after controlling for measured confounders. PIM/PPO indicators may be useful as markers of healthcare quality and patient safety. Review of prescribed medicines in patients with PIMs/PPOs may help to optimise care and improve outcomes in older people. Further prospective research is needed to explore causality in this relationship.

References

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