Medicines Evidence Commentary

commentary on important new evidence from Medicines Awareness Weekly

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Medicines optimisation: adverse outcomes from potentially inappropriate prescribing in older people living in the community

An Irish cohort study involving older people found that potentially inappropriate prescribing, identified using the STOPP criteria, was associated with increased visits to the emergency department and the GP. Potential medication omissions (defined by the START criteria) were associated with functional decline and reduced quality of life. Shared decision making should be an integral part of all decisions regarding starting and stopping medications. The NICE guideline on medicines optimisation recommends that a screening tool (for example STOPP/START) should be considered in older people to identify potential safety incidents.

Overview and current advice

Older people are susceptible to adverse effects from medications for multiple reasons, including age-related changes in physiology, pharmacokinetics and pharmacodynamics, multiple co-morbid conditions and polypharmacy. Potentially inappropriate prescribing is reported to be highly prevalent in older people, and has been associated with adverse drug events leading to hospitalisation and death. There are 2 main types of potentially inappropriate prescribing. The first is where the risks of using a medicine outweigh the likely benefits, or where safer or better alternatives exist. The second is potential prescribing omissions, in which a medicine is clinically indicated for a patient, but is not prescribed.

A tool to identify potentially inappropriate prescribing in older people was developed in 2008 called STOPP (Screening Tool of Older Persons’ Prescriptions) and START (Screening Tool to Alert doctors to Right Treatment) by Irish researchers. The original version of the tool included 65 STOPP criteria (including drug–drug and drug–disease interactions, drugs which adversely affect older patients at risk of falls and duplicate drug class prescriptions) and 22 START criteria (which assess the under-use of medicines for several common conditions). Version 2 of the STOPP/START criteria was published in 2015, which included 80 STOPP criteria and 34 START criteria.

The NICE guideline on medicines optimisation makes recommendations on developing systems for identifying, reporting and learning from medicines-related patient safety incidents. It recommends that the use of screening tools can be considered, for example the STOPP/START tool for older people.

A number of studies have investigated the prevalence of people who meet one or more STOPP/START criteria. An observational study conducted across 6 European hospitals, involving...
900 older patients, found that approximately half the people admitted to hospital met at least one STOPP/START criteria, although the prevalence varied between hospitals. Few studies have examined the impact of STOPP/START criteria on patient-oriented outcomes, or the prevalence of STOPP/START in people living in the community.

**New evidence**

A prospective cohort study aimed to determine the association between potentially inappropriate prescribing and healthcare utilisation, functional decline and quality of life, in older people living in the community.

The study included participants from The Irish Longitudinal Study on Ageing (TILDA), a nationally-representative cohort study that collects data on the health, economic and social circumstances of people aged 50 years and over living in Ireland. Data for TILDA are collected every 2 years through face-to-face interview and self-completed questionnaire.

Participants were eligible for this study if they were aged 65 years or more, had been followed up after 2 years, were eligible for the General Medical Services scheme (which provides means-tested free healthcare in Ireland) and had medical records that could be linked to their pharmacy claims data. A total of 1,753 participants were included, with a mean age of 76.5 years, a median of 6 regular dispensed medicines and 3 chronic conditions.

The primary outcome was healthcare utilisation as assessed during the TILDA interview, during which participants were asked how many times they had visited their emergency department (ED) or GP in the last 12 months. Secondary outcomes included decline in physical functioning, also assessed during the TILDA interview, during which participants were asked whether they have difficulty doing any of 6 named activities of daily living (including dressing, eating and using the toilet) due to a health or memory problem. This outcome was reported as ‘functional decline’ (increase in number of daily activities a participant reported difficulty with between baseline and follow-up) or ‘no decline’ (no increase in difficulty). Quality of life was also a secondary outcome, assessed in the TILDA self-completion questionnaire using CASP (control, autonomy, self-realisation, pleasure), a tool designed for middle-aged and older people. The investigators used a modified, 12-item version of CASP (CASP-R12) scored from 0 (worst) to 12 (best).

Potentially inappropriate prescribing was identified using 45 STOPP criteria and 15 START criteria. The investigators found that over the 12 months preceding the follow-up interview, 57.0% of participants received a potentially inappropriate STOPP medication, with 30.1% having 1 STOPP criterion, and 26.9% having 2 or more. Potential prescribing START omissions were identified in 41.8% of participants, 29.2% with 1 START criteria and 12.6% with 2 or more. About one quarter of participants (24.8%) had both STOPP and START criteria. The most common STOPP criteria were: proton pump inhibitors (PPIs) used at maximal dose for more than 8 weeks; aspirin with no history of coronary, cerebral or peripheral arterial symptoms or occlusive arterial event; and non-steroidal anti-inflammatory drugs (NSAIDs) with moderate to severe hypertension. Common START medication omissions were calcium and vitamin D supplements in osteoporosis and anticoagulation in cases of atrial fibrillation or arrhythmia.

During the 12 months preceding the follow-up interview, 16.1% of participants reported 1 ED visit, with 3.8% reporting 2 visits and 1.8% attending the ED 3 or more times. Nearly all participants reported visiting their GP during the 12 month follow-up period (96.1%, median 4 visits). People with any STOPP criterion had a higher rate of ED visits (adjusted incident rate ratio [IRR] 1.30, 95% confidence interval [CI] 1.02 to 1.66, p<0.05) and GP visits (IRR 1.15, 95% CI 1.06 to 1.24, p<0.05). The presence of a START criterion was not associated with a higher rate of ED or GP visits, although people with 2 or more START omissions had significantly more ED visits (IRR 1.45, 95% CI 1.03 to
2.04, p<0.05) and GP visits (IRR 1.13, 95% CI 1.01 to 1.27, p<0.05) compared with people meeting no START criteria.

For the secondary outcome of functional decline in activities of daily living, having any START omission was statistically significantly associated with functional decline (adjusted odds ratio [OR] 1.55, 95% CI 1.07 to 2.25, p<0.05), with a larger effect seen for people with multiple START criteria (OR 2.06, 95% CI 1.25 to 3.39, p<0.05). The presence of inappropriate STOPP prescribing was not associated with functional decline. The presence of any STOPP criteria was not associated with a statistically significant reduction in quality of life (using the CASP-R12 tool), although exposure to 2 or more START criteria was associated with a small but statistically significant reduction in quality of life.

**Commentary**

**Commentary provided by NICE**

A number of studies have estimated the prevalence of STOPP/START criteria, and the recent study by Moriarty et al. adds to this evidence base, suggesting that the presence of any STOPP criteria was associated with a 30% relative increase in ED visits and a 15% relative increase in GP visits. The presence of 2 or more START criteria was associated with functional decline and reduced quality of life. Building on these studies, the next logical step would be to investigate the impact of taking measures to reduce inappropriate prescribing on patient-oriented outcomes.

Related to this, a recent systematic review and meta-analysis by Page et al. examined the feasibility of reducing inappropriate prescribing in older people, and the impact this may have on mortality and health. The investigators pooled data from 132 randomised and non-randomised studies (total n=34,143). Data from non-randomised studies suggested that tackling inappropriate prescribing reduces mortality, although the results from randomised studies did not show any difference in mortality. It should be noted that included studies used a number of different tools to identify inappropriate prescribing, including established tools such as the STOPP/START criteria, Beers criteria, the Drug Burden Index, the Medicines Appropriateness Index and the Clinician-Rated Anticholinergic Score (CR-ACHS), although some studies did not specify which tool was used to identify inappropriate prescribing, or used an unvalidated list of target medications developed by the researchers.

When considering the results of studies on potentially inappropriate prescribing it is important to remember the importance of patient involvement and shared decision making. A recent paper by Jansen et al. discussed each step of the shared decision making process for reducing inappropriate prescribing in older people. In summary, these included:

1. Creating awareness that options exist
2. Discussing the options and their benefits and harms
3. Exploring patient preferences for the different options
4. Making the decision

The authors concluded that reducing inappropriate prescribing is an important but difficult challenge, and that shared decision making is an integral part of the process. This process requires careful tailoring, as preferences for different options and willingness, and ability to be involved in decision making vary widely.

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