Interventions to improve the appropriate use of polypharmacy for older people: an updated Cochrane systematic review

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A Rankin[a], C Cadogan[b], J Cooper[c], SM Patterson[d], N Kerse[e], CR Cardwell[f], MC Bradley[g], C Ryan[h], C Hughes[a]

[a] School of Pharmacy, Queen's University Belfast, UK
[b] School of Pharmacy, Royal College of Surgeons in Ireland, Ireland
[c] School of Psychology, Ulster University, UK
[d] Health and Social Care Board, UK
[e] Faculty of Medical and Health Sciences, University of Auckland, New Zealand
[f] Centre for Public Health, Queen's University Belfast, UK
[g] Centre for Drug Evaluation and Research, Food and Drug Administration, USA
[h] School of Pharmacy and Pharmaceutical Sciences, Trinity College Dublin, Ireland

Email: c.hughes@qub.ac.uk

The use of multiple medications (polypharmacy) in older people (>65 years) is common clinical practice and increasingly recognised as potentially problematic rather than always inappropriate. Accordingly, assessments of prescribing appropriateness need to differentiate between 'many' medicines (appropriate polypharmacy) and 'too many' medicines (inappropriate polypharmacy).[1] Selecting the most effective interventions to ensure appropriate polypharmacy in older people remains challenging.

The aim of this Cochrane review was to determine the effectiveness of interventions seeking to improve appropriate use of polypharmacy in older people, by updating the review which was published in 2014.[2]

A systematic review was undertaken using standard Cochrane methodology. A range of electronic databases (e.g. EMBASE, MEDLINE) were searched for articles published between November 2013 and May 2016 using relevant search terms (e.g. 'polypharmacy', 'inappropriate prescribing') as per original review.[2] Eligible studies (randomised controlled trials, non-randomised controlled clinical trials, controlled before-and-after studies, interrupted time-series studies) evaluated interventions aimed at improving appropriate polypharmacy in older people, using validated measures of prescribing appropriateness [e.g. Beers criteria, Medication Appropriateness Index (MAI)]. Primary outcomes of interest were changes in the prevalence of appropriate polypharmacy and hospital admissions. Secondary outcomes included medication-related problems (e.g. adverse drug reactions). Two review authors independently screened abstracts, extracted data and assessed risk of bias for included studies. Study-specific estimates were pooled for explicit/criterion-based measures (e.g. Beers) and implicit/judgement-based measures (e.g. MAI) of prescribing appropriateness using a random-effects model to yield summary effect estimates and 95% confidence intervals (CIs). The GRADE approach was used to assess the quality of evidence for pooled effect estimates. Ethical approval was not required.

Eight studies were added to the review bringing the total number of included studies to 20, involving 25,674 participants. Two interventions involved computerised decision-support and the remainder comprised complex pharmaceutical care-based interventions across various clinical settings. Changes in medication appropriateness scores using implicit tools showed a greater reduction in inappropriateness between baseline and follow-up in intervention groups compared to control groups (mean difference -6.34, 95% CI -12.23, -0.45). Assessments of the number of potentially inappropriate medications (PIMs) and potential prescribing omissions (PPOs) using explicit tools showed fewer PIMs

(standardised mean difference -1.06, 95% CI -2.01, -0.12) and fewer PPOs per participant (standardised mean difference -0.81, 95% CI -0.98, -0.64) in intervention groups compared to control groups post-intervention. The proportion of patients prescribed ≥1 PIM (relative risk 0.61, 95% CI 0.42-0.89) was lower in intervention groups compared to control groups post-intervention. The overall quality of evidence for all pooled outcomes was low or very low. Evidence of the effects of interventions on hospital admissions and medication-related problems was conflicting.

This updated review found that included intervention studies reduced inappropriate prescribing for older people receiving polypharmacy. However, the quality of evidence from pooling data across studies remains weak. It is also still unclear whether interventions resulted in clinically significant improvements for patients. Future intervention studies could benefit from available guidance relating to intervention development, evaluation and reporting.

This work was supported by the Health Research Board [grant number: HRC/2014/1].

1. Cadogan CA, Ryan C, Hughes CM. Appropriate polypharmacy and medicine safety: when many is not too many. Drug Safety 2016; 39(2): 109-16.
2. Patterson SM, Cadogan CA, Kerse N et al. Interventions to improve the appropriate use of polypharmacy for older people. Cochrane Database Syst Rev 2014; 10: CD008165.