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Special Article

Research Priorities for Optimizing Geriatric Pharmacotherapy: An International Consensus

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A B S T R A C T

Medication management is becoming increasingly challenging for older people, and there is limited evidence to guide medication prescribing and administration for people with multimorbidity, frailty, or at the end of life. Currently, there is a lack of clear research priorities in the field of geriatric pharmacotherapy. To address this issue, international experts from 5 research groups in geriatric pharmacotherapy and pharmacoepidemiology research were invited to attend the inaugural Optimizing Geriatric Pharmacotherapy through Pharmacoepidemiology Network workshop. A modified nominal group technique was used to explore and consolidate the priorities for conducting research in this field. Eight research priorities were elucidated: quality of medication use; vulnerable patient groups; polypharmacy and multimorbidity; person-centered practice and research; deprescribing; methodological development; variability in medication use; and national and international comparative research. The research priorities are discussed in detail in this article with examples of current gaps and future actions presented. These priorities highlight areas for future research in geriatric pharmacotherapy to improve medication outcomes in older people.

The process of prescribing, dispensing, administering, and monitoring medications for older people is becoming increasingly challenging, especially in the presence of multimorbidity and frailty. In the United States, the proportion of community-dwelling older adults who use 5 or more medications has tripled to 39% over a 20-year period.[1] Up to 74% of residents of long-term care facilities use 9 or more medications on a regular basis.[2] As a consequence, the average proportion of residents who use 1 or more potentially inappropriate medications has increased from 30% in studies conducted before 1999 to nearly 50% in studies conducted after 2005.[3]

Advances in pharmacotherapy have brought about considerable improvements in patient care. However, age-related pharmacokinetic and pharmacodynamic changes combined with multimorbidity, decline in cognition, and impaired functional status mean older people are more vulnerable to adverse drug events (ADEs).[4] Frailty may confer additional risk, with ADEs in this population often presenting as geriatric syndromes such as falls and delirium.[5] Medication-related harms continue to be associated with considerable economic, clinical,

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and humanistic costs. Polypharmacy and complex medication regimens are independent predictors of hospitalization for people living in community[6] and residential aged care settings.[7] Direct and indirect harms arising from medication use are implicated in up to 30% of unplanned hospitalizations in those aged 75 years or older, with up to three-quarters of these hospitalizations estimated to be potentially preventable.[8]

There is limited evidence to inform prescribing decisions for older people. Older people who are frail, experience multimorbidity, or have polypharmacy rarely participate in randomized controlled trials (RCTs).[9] Prescribing decisions are often based on evidence extrapolated from RCTs conducted in younger and healthier people. Despite a number of recent initiatives, disease-specific clinical practice guidelines rarely provide recommendations specific to older people with multimorbidity, frailty, or at the end of life. Moreover, there is a lack of clear priorities in the field of geriatric pharmacotherapy research.

The objective of this article is to present research priorities for optimizing geriatric pharmacotherapy formulated at an international multidisciplinary workshop in Stockholm, Sweden, in May 2017.

Methods

The 2-day inaugural Optimizing geriatric Pharmacotherapy through Pharmacoepidemiology Network (OPPEN) workshop was hosted by the Aging Research Center, Karolinska Institutet. Five research groups devoted to geriatric pharmacotherapy and pharmacoepidemiology from Australia, Belgium, Finland, Italy, and Sweden were represented. Participants included 2 geriatricians, 5 pharmacists, 2 social scientists, a clinical pharmacologist, a nurse, and a biostatistician. Using a modified nominal group technique,[10] participants worked in international mixed discipline groups of 2 or 3 participants to produce a list of research priorities. The facilitator then asked each group to volunteer 1 research priority in turn until an exhaustive list of research priorities was discussed, revised, and documented. New research priorities generated in the wider group were also discussed, revised, and documented. All research priorities were thematically combined into a final list of 8 research priorities. The final list of 8 priorities was discussed by all participants until final consensus was reached. Priorities are summarized below and in Table 1.

Priorities

Underuse, Overuse, and Misuse of Medications

The prevalence of inappropriate medication use continues to increase in older people residing in the community and residential aged care settings.[3] It has been reported that the majority of emergency hospitalizations for recognized ADEs in older adults result from relatively few commonly used medications.[11] For example, up to 60% of US emergency department visits for ADEs in older adults (aged ≥65 years) are the result of 3 drug classes (anticoagulants, diabetes agents, and opioid analgesics).[12] Research should, thus, focus on medications that are responsible for the highest burden of morbidity and mortality, including these high-risk medications not deemed potentially inappropriate in commonly applied explicit criteria.[12] The development and validation of indicators predictive of medication-related hospitalizations from different practice settings would be beneficial.

To address issues of suboptimal medication use, research should be conducted into identifying safer medication and nonmedication alternatives to potentially inappropriate or unnecessary medications.[13] Research should not only focus on strategies to discontinue inappropriate or unnecessary medications, but also on addressing potential underuse of clinically indicated and appropriate medications.[14] In addition, it should be acknowledged that whether or not medications are indicated may depend on each patient's current goals of care, personal preferences, and life expectancy.[15]

Furthermore, research should assess the possible contribution of medications to geriatric syndromes such as frailty, falls, incontinence, and cognitive impairment.[16–18] These geriatric syndromes are seldom comprehensively assessed in RCTs but are important due to their association with negative outcomes including functional decline,[19] hospitalizations,[20] and mortality.[21] Pharmacoepidemiologic research can, thus, have an important role in investigating the interplay between medication use and geriatric syndromes.[22,23]

Medications in Frail and Vulnerable Patient Groups

Particular subsets of the older population require special consideration when prescribing, dispensing, administering, and monitoring medications. These include those who are frail, experience multimorbidity, have cognitive impairment,[24–26] are socially and economically disadvantaged,[27] have renal or hepatic impairment,[28,29] are unable to self-manage their own medication regimen,[30] those that reside in residential aged care, and those at the end of life.[31] These vulnerable patient groups present unique challenges with regards to medication use. People in these population groups are often excluded from RCTs, and RCTs that include people from these population groups may do so in insufficient numbers to conduct sufficiently powered subanalyses. For this reason, prescribing recommendations in disease-specific clinical practice guidelines based on research conducted in adult populations may not be applicable to these vulnerable patient groups.[4] Further research is needed to better understand the benefits and risks of medication treatment specific to each of these groups. This can lead to the development of clinical services that better recognize and respond to ADEs.

Research should also recognize that biological age may be a better predictor of drug response or failure than chronological age. The use of polypharmacy and inappropriate medications have been reported to be associated with frailty,[16,32–34] and frailty may impact on patient medication adherence and response to therapy.[35] For example, frailty-related parameters were more strongly associated with impaired gait performance than the use of psychotropic drugs.[36] Conversely, no evidence was found that frailty modifies the effect of antihypertensive treatment in people aged 80 years and older.[37] Pharmacoepidemiologic research should, thus, assess the potential modifying effects of frailty when studying the benefits and harms of medications.

Understanding and Informing Prescribing in People With Multimorbidity and Polypharmacy

Multimorbidity is associated with reduced quality of life (QoL), higher mortality, polypharmacy, higher rates of ADEs, and greater health service use.[38] The National Institute for Health and Care Excellence guidelines on multimorbidity highlight the importance of addressing this issue.[38] Treatment regimens can become very burdensome for people with multimorbidity, and care can become uncoordinated and fragmented. Polypharmacy in people with multimorbidity is often the result of multiple preventative medications prescribed in relation to disease-specific guidelines. However, the appropriateness for using these medications weakens if life expectancy is reduced by other conditions or frailty. Further research into developing guidelines that are safe and effective in people with multimorbidity is needed.[38,39]

The evidence base for managing chronic diseases is largely drawn from trials of interventions for single conditions and individuals with multimorbidity are often excluded from these trials.[40,41] Older patients with multimorbidity and polypharmacy are, thus, often underrepresented in clinical trials of medications. Age disparities between patients participating in clinical trials and those encountered