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REVIEW

Interventions to optimize pharmacologic treatment in hospitalized older adults: A systematic review☆

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KEYWORDS
Elderly;
Hospitalized;
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Treatment review

Abstract
Objective: To summarise the evidence on interventions aimed at optimising the drug treatment of hospitalised elderly patients.
Material and methods: We conducted a search in the main medical literature databases, selecting prospective studies of hospitalised patients older than 65 years who underwent interventions aimed at optimising drug treatment, decreasing polypharmacy and improving the medication appropriateness, health outcomes and exploitation of the healthcare system.
Results: We selected 18 studies whose interventions consisted of medication reviews, detection of predefined drugs as potentially inappropriate for the elderly, counselling from a specialised geriatric team, the use of a computer support system for prescriptions and specific training for the nursing team. Up to 14 studies assessed the medication appropriateness, 13 of which showed an improvement in one or more of the parameters. Seven studies measured the impact of the intervention on polypharmacy, but only one improved the outcomes compared with the control. Seven other studies analysed mortality, but none of them showed a reduction in that rate. Only 1 of 6 studies showed a reduction in the number of hospital readmissions, and 1 of 4 studies showed a reduction in the number of emergency department visits.
Conclusions: Despite the heterogeneity of the analysed interventions and variables, we obtained better results in the process variables (especially in medication appropriateness) than in those that measured health outcomes, which had greater variability.

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PALABRAS CLAVE
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Intervenciones para optimizar el tratamiento farmacológico en ancianos hospitalizados: una revisión sistemática

Resumen
Objetivo: Resumir la evidencia sobre las intervenciones orientadas a optimizar el tratamiento farmacológico en ancianos hospitalizados.
Material y métodos: Se realizó una búsqueda en las principales bases de datos bibliográficas, seleccionando estudios prospectivos en pacientes mayores de 65 años hospitalizados que realizaran intervenciones dirigidas a optimizar el tratamiento farmacológico, disminuir la polifarmacia y mejorar la adecuación terapéutica, los resultados en salud o el aprovechamiento del sistema sanitario.
Resultados: Se seleccionaron 18 estudios. Las intervenciones consistieron en revisiones de medicación, detección de medicamentos predefinidos como potencialmente inadecuados en ancianos, asesoramiento de un equipo especializado en geriatría, uso de un sistema informático de apoyo a la prescripción o formación específica al equipo de enfermería. Hasta 14 estudios evaluaron la adecuación terapéutica, demostrando 13 de ellos una mejoría en alguno de los parámetros. Siete estudios midieron el impacto de la intervención sobre la polifarmacia, pero solo uno mejoró los resultados respecto al control. Otros siete estudios analizaron la mortalidad, no demostrándose una disminución de la misma en ninguno. Solo uno de seis estudios mostró una reducción de reingresos hospitalarios y uno de cuatro estudios una disminución de las visitas a urgencias.
Conclusiones: Pese a la heterogeneidad de las intervenciones y de las variables analizadas, se obtuvieron mejores resultados en las variables de proceso, especialmente en la adecuación terapéutica, que en aquellas que midieron resultados en salud, donde hubo una mayor variabilidad.

Background

Drug therapy is one of the most important tools available for preserving and improving health; however, the use of medications is not without risk. The high prevalence of adverse events due to medication[1] is a significant public health problem, due to the significant morbidity and mortality they cause,[2,3] which entail a significant consumption of resources and high healthcare costs.[4,5] This problem is especially relevant for the elderly, who have numerous factors that contribute to a greater risk of drug iatrogenesis. These factors include age-related changes in pharmacokinetics and pharmacodynamics[6,7] and the combination of chronic diseases that inevitably lead to polypharmacy.

A number of studies in Spain have shown that the prevalence of polypharmacy (defined as the consumption of more than 5 drugs a day) in patients older than 65 years is approximately 50%[8,9] and that polymedicated patients consume a mean of almost 9 medications a day.[8] Polypharmacy is strongly linked to drug-related adverse events, interactions and interferences between the drugs and the disease itself,[10,11] to lack of treatment adherence[12] and, ultimately, to mortality.[13] Other patient-related factors, such as frailty, geriatric syndromes, dependence and cognitive impairment, frequently overlap, increasing the complexity of medication use, which ultimately leads to poorer health outcomes. For example, it is estimated that between 10% and 20% of hospital admissions for elderly patients in Spain are associated with medication-related adverse events,[14,15] which quadruple the risk when compared with younger patients.[16]

All of these problems gain special relevance in elderly hospitalized patients. Hospitalization is an especially delicate situation for the elderly and is associated with higher morbidity, mortality and cognitive and functional impairment.[17,18] The incorporation of new prescribers and the increase in the number of drugs during hospitalization contribute to the risk of iatrogenesis and the complexity of administering drugs.[19,20]

The progressive aging of the population predicts that medication-related problems in the elderly will be increasingly common. Fortunately, most medication-related adverse events are considered preventable.[21] Improving therapeutic appropriateness could therefore help minimize the problem. The issue of prescription quality in the elderly has generated significant interest in the scientific community, which, in an attempt to define it, has coined terms such as ''therapeutic appropriateness'' and has led to the development of numerous tools to quantify it (Appendix A).

Considering the complexity of administering drugs to elderly hospitalized patients and the high prevalence of inappropriate prescriptions,[19,22] it seems that we need to incorporate strategies aimed at optimizing drug treatment. Although it has been previously mentioned that hospitalization is an especially appropriate period for implementing strategies for improving the quality of the use of