Workshop
Health and well-being

Title
Longitudinal data analysis of a regional hospital register to explore the profiles of polymedicated older inpatients with multiple chronic conditions: a multiple-cluster model strategy

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Abstract

Background: There is a well-documented relationship between the recurrent hospitalisation of polymedicated, home-dwelling older adults with multiple chronic conditions and their medication-related problems (MRPs). Moreover, up to 25% of emergency department visits by home-dwelling older adults with multiple chronic conditions are due to MRPs (1). However, 60% of MRPs in patients visiting an emergency department with non-specific complaints (such as weakness, fatigue or exhaustion) may go undiagnosed as such, and 83% of undiagnosed MRPs can be responsible for acute, devastating morbidity (1). MRPs can lead to a degradation of the patient's clinical condition, physical and cognitive decline, an exacerbation of chronic medical conditions and avoidable health costs (1, 2).

Many MRPs are nevertheless preventable (1, 3, 4). Besides issues involving medication adherence, numerous authors have reported how inappropriate medication prescription, in terms of drug type, adverse effects, duration and posology, can also result in multiple avoidable hospitalisations. Furthermore, up to 58% of medicine-related hospitalisations may be preventable with appropriate primary care (3). Preventability, along with an understanding of risk factors, is crucial to designing interventions which minimise numbers of MRPs or even eliminate them (3).

Optimal medication management is one of the necessary conditions for enabling polymedicated, home-dwelling older adults with multiple chronic conditions to avoid hospitalisation and remain at home. However, it remains unclear which home-dwelling older-adult profiles and which types of medicines they take increase the risks of emergency department visits, rehospitalisation, institutionalisation or early death due to MRPs. Existing, large, longitudinal clinical and medical hospital registers could be synthesised to better understand the sociodemographic, clinical and medical features of older adults who are regularly hospitalised as a result of suboptimal medication management.

Aim: To distinguish the profiles of patients hospitalised for MRPs which risk increasing the number of emergency department visits, rehospitalisation, institutionalisation or early death, by examining a large, longitudinal register of administrative, clinical and medical data from a regional hospital in Switzerland. Additionally, to explore the factors that might increase the probability of such critical events and analyse their impact on inpatients' health. The profiles identified and extracted from the hospital data will allow us to proceed to purposive sampling—of those polymedicated, home-dwelling, older adults with multiple chronic conditions who present with more risk factors—for qualitative data collection focused on medication management at home.

Method: A mixed-methods study will address the medication management of polymedicated, home-dwelling, older adults with multiple chronic conditions. There will be two major project phases conducted sequentially over time: a quantitative phase followed by a qualitative phase. In the former, we will synthesise a large longitudinal dataset extracted from a regional Swiss hospital register, including the administrative, clinical and medical data of the emergency admissions and planned hospitalisations of older adults, from 2015 to 2018. Various clustering methods will be used to identify profiles across the different dimensions of the inpatients' condition (psychological, somatic, diagnostic, medication, etc.) or to discover similar types of variables within the same dimensions. These profiles will be used in further longitudinal and survival analyses to investigate their relationships with MRPs and critical health events.

Expected Results: Approximately 50,000 older inpatients and 50,000 older adults admitted to emergency departments will be involved in extensive longitudinal data analysis. Multiple clusters will be generated, identifying the typical profiles of poly-medicated, home-dwelling, older adults, and differentiating those at low, moderate and high risk of adverse health outcomes within the context of suboptimal management at home. Relationships with prescribed medicines will be established. Linear and logistic multinomial regressions will be used to assess the associations between identified clusters and the risk of hospitalisation, emergency department visits, hospital readmission (notably for MRPs), institutionalisation or early death.

Conclusion: The results of this extensive, longitudinal, dataset analysis will contribute to stratifying the readmission risks of older adults hospitalised or admitted to an emergency department for MRPs. These findings

are expected to provide evidence about the profiles of polymedicated, home-dwelling, older adults with multiple chronic conditions at risk of adverse health outcomes in relationship with suboptimal medication management.

References

1.   Nickel CH, Ruedinger JM, Messmer AS, Maile S, Peng A, Bodmer M, et al. Drug-related emergency department visits by elderly patients presenting with non-specific complaints. Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine. 2013;21:15.
2.   Fallis BA, Dhalla IA, Klemensberg J, Bell CM. Primary medication non-adherence after discharge from a general internal medicine service. PLo e61735 doi101371journalpone0061735. 2013;8.
3.   Al Hamid A, Ghaleb M, Aljadhey H, Aslanpour Z. A systematic review of hospitalization resulting from medicine-related problems in adult patients. British journal of clinical pharmacology. 2014;78:202-17.
4.   Pellegrin KL, Lee E, Uyeno R, Ayson C, Goo R. Potentially preventable medication-related hospitalizations: A clinical pharmacist approach to assessment, categorization, and quality improvement. Journal of the American Pharmacists Association. 2017;57:711-6.