SGIM Foundation
Monbijoustrasse 43
Postfach
3001 Bern

Project Funding 2016/17

«Research projects for Multimorbidity»

The award of CHF 50'000.-- is granted to the following project:

Principal Investigator:

Dr. med. Carole Elodie Aubert
Inselspital, KAM, Freiburgstrasse, 3010 Bern
E-mail: caroleelodie.aubert@insel.ch

Abstract

Background:
Multimorbidity affects the majority of elderly adults and is associated with higher healthcare costs and utilization. It is currently mainly assessed simply as a total number of diseases, or by weighting the different diseases together. However, little is known on the patterns of multimorbidity, what are the frequent combinations of diseases, and which combinations are associated with higher healthcare resource utilization, such as hospital readmission.

Objectives:
a) To identify in multimorbid medical inpatients the most common combinations of diseases and to study their association with hospital readmission.
b) To study in multimorbid medical inpatients the association of the most common combinations of diseases with 30-day potentially avoidable readmissions.
c) To evaluate the type of relationship (additive or not) between each additional disease and the risk of readmission in multimorbid medical inpatients.
d) To study in multimorbid medical inpatients the association of the most common combinations of diseases with the length of stay.
e) To better characterize multimorbidity in medical inpatients according to: chronic versus not chronic diseases, number of and most frequent body systems involved.

Methods:
We will use a retrospective cohort of medical adults including about 130,000 discharges from ten large hospitals across four countries between 2010 and 2012. The primary outcome will be any 30-day readmission. The secondary outcome will be any 30-day potentially avoidable readmission. Since we are looking at the combination of multiple diseases, we will focus on patients with multimorbidity. Based on the literature, around two thirds of the patients have multimorbidity, which will correspond to more than 85,000 patients in our cohort.

Diseases will be grouped into clinically relevant categories using the Clinical Classification Software (CCS) tool, and differentiated into chronic versus not chronic diseases using the Chronic Condition Indicator (CCI), both developed by the Agency for Healthcare Research

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and Quality (AHRQ). We will describe the patterns and frequencies of combinations of diseases and display simple pairwise correlations between diseases in a heat map. Factor analysis will be used to identify the most frequent combinations of diseases. We will use multivariate regression analysis to identify the association of single diseases as well as of specific combinations of diseases with readmission. We will assess potential interactions between diseases and between combinations of diseases in regard to readmission to study non-additive relationships. In a cross-sectional analysis, we will study the association of specific combinations of diseases with the length of stay.

Innovation and implications

The main innovations of this study are following: 1) advanced statistical analysis to explore combinations of multiple diseases; 2) discrimination of the chronic from not chronic diseases using a high-quality tool from the AHRQ; 3) identification of specific combinations of diseases associated with readmission or length of stay; 4) focus on medical inpatients; 5) use of a large international multicenter cohort with high-quality data.

This study has the potential to help better understanding multimorbidity and its associations with healthcare resource utilization. The main clinical implication is that it may help to ensure more strategic and more tailored healthcare to multimorbid patients, i.e. patient-, rather than disease-oriented prevention, diagnosis, treatment, and prognosis. Altogether, we may expect a benefit on quality of care, patients' health outcomes, and healthcare expenditures.

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