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Tracking Regional Variation in Healthcare
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Abstract

ZENTRALINSTITUT FÜR DIE KASSENÄRZTLICHE VERSORGUNG IN DEUTSCHLAND

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Nature of the paper (check boxes)

☐ report on implementation project / experience / policy perspectives

☒ scientific research a) describing work in progress ☐ b) new methods ☒ c) presenting results ☒

Title

Adherence to evidence-based drug therapies after myocardial infarction: is geographic variation related to hospitals or primary care providers?

Background

Clinical guidelines (1) recommend combined treatment with antiplatelets, beta blockers, agents acting on the renin-angiotensin system and statins for secondary prevention after Myocardial Infarction (MI). However, observational studies reported poor adherence to chronic polytherapy. Also, a high geographic variation was observed between areas of residence in the Lazio region. The adjusted proportions of adherence to chronic polytherapy after MI ranged from 54% to 80%.
From the current scientific evidence it is not possible to quantify how much of the “distance from clinical guidelines” is attributable to the patient behavior, to the therapeutic approach recommended at hospital discharge or to the primary care providers. Using the "cross-classified" regression models it is possible to apply the multilevel methodology to data which are not purely hierarchical, properly handling levels which are crossed with each other, such as hospitals of discharge and primary care providers.

Objectives

Aim 1. To measure adherence to polytherapy after MI in clinical practice.
Aim 2. To measure and compare the proportion of variation attributable to the hospitals of discharge and to the primary care providers (i.e. general practitioners, health districts, local health units).

Methods

Using linked health information systems from the Lazio region (about 5 million residents), Italy, we identified a cohort of patients discharged from the hospital with an incident diagnosis of MI between 2007-2010. Patients were followed-up for two years, starting from the day of discharge. Adherence to polytherapy was defined as a medication possession ratio >= 0.75 for at least three of the four evidence-based drugs. The variation among health care providers was analyzed applying Empirical Bayes methods. Cross-classified multilevel models were performed to analyze geographic variation, by measuring and comparing the proportions of variability attributable to hospitals of discharge and primary care providers. The variance components were expressed in terms of Median Odds Ratios (MORs). The MOR quantifies the variation between clusters (i.e. the health care providers). This measure is always greater than or equal to 1. If the MOR is 1, there is no variation between clusters. If there is considerable between-cluster variation, the MOR will be large (2).

Results

The "hierarchical" healthcare system was was composed as follows: 9606 patients (68% were males, the mean age was 67 +/- 13 years), 2156 general practitioners, 55 health district, 12 local health units, and 93 cross-classified hospitals of discharge. About 63% of MI patients were adherent to chronic polytherapy. Among the determinants of poor adherence, we found that older age and comorbidities such as heart failure, arrhythmia and COPD played an important role. When analyzing variation among primary care providers, after controlling for patients' and general practitioners' characteristics, a relevant variation between health districts was detected (MOR=1.24, p<0.001). The variability among general practitioners belonging to the same health district was instead not statistically significant (MOR=1.06, p=0.458). When introducing the hospital of discharge as a cross-classified level, the variation between health district decreased (MOR=1.13, p=0.020), whereas the variability among hospitals was higher (MOR=1.37) and statistically significant (p<0.001).

Conclusion/Discussion/Policy Perspective

The Lazio region is characterized by poor adherence to chronic polytherapy after MI and high geographic variation. Multilevel models were used for detecting the sources of variation within the regional health system. The variance components estimated by the cross-classified model are very interesting. They allow to measure and compare the amount of variation attributable to the neighboring phases of the pathway for MI patient care: the discharge phase and the following primary care phase. The reduction of the variability among health districts after entering the hospital level shows that the differences we observe in primary care substantially "reproduce" the clinical and organizational approach of the hospital of discharge, whose aims are both the correct setting of drug therapy, and the planning of the subsequent visits for patient monitoring. We believe that this methodology may help to identify the priority lines of action to improve adherence and define areas for more targeted health-care interventions.

Literature

1) Secondary prevention in primary and secondary care for patients following a myocardial infarction. NICE Clinical Guidelines, 2013 update.
2) Larsen K, Merlo J. Appropriate Assessment of Neighborhood Effects on Individual Health: Integrating Random and Fixed Effects in Multilevel Logistic Regression. American Journal of Epidemiology, 2005; 161: 81-88.