

Clinical Research

Length of Initial Prescription at Hospital Discharge and Long-term Medication Adherence for Elderly Patients With Coronary Artery Disease: A Population-Level Study

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ABSTRACT

Background: Patient adherence to cardiac secondary prevention medications declines over time. We examined whether the length of the initial prescription at hospital discharge after coronary angiography would be associated with long-term adherence.

Methods: We conducted a population-level cohort study to examine adherence to cardiac medications for 18 months after coronary angiography in elderly patients with coronary artery disease (CAD). We

RÉSUMÉ

Introduction : L'observance médicamenteuse en matière de prévention secondaire de la maladie du cœur diminue avec le temps. Nous avons examiné si la durée de l'ordonnance initiale remise au congé de l'hôpital après la coronarographie pourrait être associée à l'observance à long terme.

Méthodes : Nous avons mené une étude de cohorte à l'échelle de la population pour examiner l'observance des traitements

Patients with documented coronary artery disease (CAD) have an increased risk of subsequent cardiovascular events, including myocardial infarction (MI), heart failure, and death.¹ Guidelines stress that the initiation and long-term maintenance of evidence-based secondary prevention medications such as antiplatelet agents, angiotensin-converting enzyme inhibitor or angiotensin receptor blockers (ACE-I/ARB), β -blockers (BBs), and statins are essential for improving cardiovascular outcomes.^{2,3} Unfortunately, adherence to cardiac secondary prevention medications declines

over time, and this decreased adherence is associated with increased mortality.⁴⁻⁹

The purpose of this study was to identify factors associated with adherence to cardiac secondary prevention medications in patients in whom CAD was evident during angiography. In particular, we assessed whether the length of the initial prescription given to the patient after angiography was associated with long-term adherence, based on our clinical observation that many patients were offered brief prescriptions to encourage early outpatient follow-up.

Methods

We conducted a retrospective cohort study to examine adherence to cardiac secondary prevention medication 18 months after coronary angiography. The Research Ethics Board at Sunnybrook Health Sciences Centre approved this study.

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See page 1413 for disclosure information.

identified patients with clinical indications for angiotensin-converting enzyme inhibitors or angiotensin receptor blockers (ACE-I/ARB), beta-blockers (BB), and/or statins. In each medication class cohort, we defined high adherence as proportion of days covered (PDC) > 80%. The length of the initial prescription was defined as 0-30 days, 31-60 days, and more than 60 days. We controlled for patient sociodemographic factors, previous adherence, and comorbidities.

Results: The ACE-I/ARB cohort included 13,305 patients, the BB cohort included 5,792 patients, and the statin cohort included 16,134 patients. Using < 30 days as the reference, initial prescriptions covering at least 60 days were more likely to result in high long-term adherence for ACE-I/ARB (adjusted odds ratio [aOR], 4.1; 95% confidence interval [CI], 3.6-4.7); BB (aOR, 2.4; 95% CI, 1.9-3.1), and statins (aOR, 3.0; 95% CI, 2.6-3.4). More than 80% of patients had outpatient follow-up with a primary care provider within 30 days, and this did not vary based on length of initial prescription.

Conclusions: Giving patients longer prescriptions for cardiac secondary prevention medications at hospital discharge seems to increase the likelihood of high long-term adherence in elderly patients.

Databases

We used population-based administrative records linked through a unique identifier at the Institute for Clinical Evaluative Sciences. Data were compiled from the following databases: (1) the Ontario Drug Benefits (ODB) database, covering all medications prescribed to persons in Ontario older than 65 years^{10,11}; (2) the Canadian Institute for Health Information Discharge Abstract Database covering hospital discharge diagnoses¹² using International *Classification of Disease* (ICD) codes, permitting the calculation of the Charlson comorbidity score¹³; (3) the Ontario Health Insurance Plan (OHIP) database, covering physician billings for procedures and consultations¹⁴; (4) the Registered Persons Database, covering demographic information including date of death; and (5) the Cardiac Care Network of Ontario (CCN) cardiac registry, with clinical variables collected at the time of angiography. The CCN cardiac registry has recently been used as a reference standard to validate other databases.¹⁵

Patient cohorts

We examined patients with CAD identified during coronary angiography that was performed between October 1, 2008 and September 30, 2009. The included cohort had at least 70% blockage in at least 1 vessel or at least 50% blockage in the left main coronary artery. Medication data in the ODB is captured for all patients older than 65 years. Therefore, restricting enrollment to patients aged 65 years plus 120 days allowed us to account for prescriptions started before the date of angiography.

médicamenteux contre la maladie du cœur durant les 18 mois suivant la coronarographie chez les patients âgés ayant une coronaropathie. Nous avons repéré les patients dont les indications cliniques justifient la prise d'inhibiteurs de l'enzyme de conversion de l'angiotensine ou d'antagonistes des récepteurs de l'angiotensine (IECA/ARA), de bêta-bloquants (BB), et/ou de statines. Dans chacune des cohortes par classe de médicaments, nous avons défini comme élevée l'observance dont la proportion de jours a été > 80 %. La durée de l'ordonnance initiale a été définie comme suit : de 0 à 30 jours, de 31 à 60 jours et de plus de 60 jours. Nous avons tenu compte des facteurs socio-démographiques des patients, de l'observance antérieure et des comorbidités.

Résultats : La cohorte recevant les IECA/ARA incluait 13 305 patients, la cohorte recevant les BB incluait 5 792 patients et la cohorte recevant les statines incluait 16 134 patients. En utilisant moins de 30 jours comme référence, les ordonnances initiales couvrant au moins 60 jours ont été plus susceptibles d'entraîner une observance à long terme élevée du traitement par IECA/ARA (ratio d'incidence ajusté [RIAA] = 4,1; intervalle de confiance [IC] à 95 %, 3,6-4,7); du traitement par BB (RIAA = 2,4; IC à 95 %, 1,9-3,1), et du traitement par statines (RIAA = 3,0; IC à 95 %, 2,6-3,4). Plus de 80 % des patients ont obtenu dans les 30 jours un suivi ambulatoire par un prestataire de soins primaires, et cela n'a pas varié selon la durée de l'ordonnance initiale.

Conclusion : Le fait de remettre aux patients au congé de l'hôpital des ordonnances plus longues de médicaments ayant trait à la prévention secondaire de la maladie du cœur semble augmenter la probabilité d'obtenir une observance élevée à long terme chez les patients âgés.

From the entire cohort of patients with CAD, we created 3 medication class cohorts to identify patients who had clinical indications for long-term use of ACE-I/ARB, BBs, and/or statins based on class 1A evidence from recent guidelines³: the ACEI/ARB cohort included patients with diabetes *or* hypertension *or* decreased left ventricular ejection fraction (< 50%); the BB cohort included patients with decreased left ventricular ejection fraction (< 50%) *and* New York Heart Association class II-IV *or* a history of MI before or as indication for angiography; the statin cohort was not limited because guidelines recommend long-term use of statins in all patients with evidence of CAD.² We did not assess antiplatelet medications because clopidogrel is not indicated for long-term use in many patients and because acetyl salicylic acid is usually purchased over the counter without a prescription in Ontario. We limited analyses to patients who survived 18 months after angiography.

Outcome: assessment of adherence

In each medication class cohort, we assessed adherence using the proportion of days covered (PDC) technique, in which the days supplied during each interval is divided by the number of days in the interval. The PDC was calculated 540 days (ie, 18 months) after angiography. Patients not prescribed any medication in a class would have PDC equal to zero. When patients were dispensed a prescription renewal before the end of their previous prescription period, the excess supply was carried over to the next period, but the maximum PDC for the interval was equal to 1. We dichotomized patients based on their PDC into high and not-high adherence, with high-adherence defined as PDC > 80%.⁸

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