

Optimizing prevention and guideline-concordant care in Montenegro



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ABSTRACT

Background: Guidelines recommend use of evidence-based medications in patients discharged after an acute coronary syndrome (ACS). Yet the current rates of adherence in many eastern European countries are unknown.

Objective: To determine whether 6 month outpatient follow-up after ACS is associated with recommended rates of medication adherence in Montenegro.

Methods: A prospective analysis was conducted in 585 ACS patients confirmed to be alive after ACS at 6 month follow-up. The study was undertaken between 2012 and 2015, from 9 International Survey of Acute Coronary Syndrome in Transitional Countries (ISACS-TC) hospitals in the Montenegro. The primary outcome was guideline-concordant care, defined as 100% compliance with 5 medications: aspirin, clopidogrel, beta-blockers, and statins in ACS patients, and angiotensin-converting enzyme inhibitors or angiotensin receptor blockers [ACEI/ARB] for the subset of patients with left ventricular systolic dysfunction, as assessed by an ejection fraction less than 40% at discharge. In addition to the composite end point, the achievement of each single treatment measure was analyzed. Multivariate predictors of long-term medication adherence were also identified.

Results: Guideline-concordant care (GCC) at discharge increased from 2012 to 2015 (adjusted OR for increase 1.51; CI 0.88–2.52). GCC over 6 months was adhered in 73% of patients. In patients who did not achieve GCC, adherence was persistently high with 92.3% for aspirin, 91.3% for statins and 72% for ACE-inhibitors or angiotensin-receptor blockers (ARBs). Adherence was lower for clopidogrel (57.7%) and beta-blockers (64.4%). After adjusting for demographic and clinical differences, in-hospital referral to PCI and ST segment elevation myocardial infarction (STEMI) were associated with greater medication adherence at 6 month follow-up.

Conclusions: In Montenegro, long-term adherence to evidence-based medication after ACS is high. Adherence to guideline-recommended therapies increased over time with participation to the ISACS-TC. The lower achievement of GCC in patients treated medically and in those with non-ST-segment elevation ACS needs particular attention.

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1. Introduction

Suboptimal treatment and disparities after acute coronary syndrome (ACS) may contribute to poor survival [1,2]. Previous studies on in-hospital management of ACS in transitional countries have shown discharge orders with high rates of evidence based therapies. [3]. How these results might apply to ambulatory care during follow-up is unclear. Furthermore, it would be important to evaluate the impact that large-scale international quality improvement programs would have had in improving adherence to guideline recommendation in specific countries, as cultural differences may explain different compliance patterns.

We sought to assess the outpatient hospital-based patients' adherence to evidence-based treatment guidelines during the first 6 months

after an ACS in Montenegro. The study cohort was a subset of patients who were enrolled in an international project to assess and improve the care of patients after an ACS (International Survey of Acute Coronary Syndrome in Transitional Countries – ISACS-TC). A corollary objective of this study was to investigate the influence of clinical presentation and in-hospital therapeutic management on evidence based treatment prescriptions and adherence.

2. Methods

2.1. Sources of data

The ISACS-TC project tracks all drug prescriptions and patients' adherence from outpatient clinic visits in 12 countries with economy in transition. Details of the ISACS-TC have been published previously [4–12]. Automated physicians' records are an excellent source of medication data because these records are not subject to information bias. Each record was screened to ensure that ACS was the principal diagnosis [13]. Data on the rates of patient invasive procedures and mortality were also obtained. The time frame for data collection was all ACS discharges in Montenegro between 2012 and 2015.

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Only patients who were not lost at 6 month follow-up were selected for this analysis. Therefore, we excluded 30 patients who died in the hospital and 188 patients who died or were lost during follow-up (Fig. 1).

2.2. Data definitions and outcome measures

The primary outcome was guideline-concordant care (GCC), defined as 100% compliance with all 5 ISACS-TC quality measures given at discharge: aspirin, clopidogrel, beta-blockers, and statins in coronary artery disease patients, and angiotensin-converting enzyme inhibitors or angiotensin receptor blockers [ACEI/ARB] for patients with left ventricular systolic dysfunction (as assessed by an ejection fraction less than 40% at discharge). In addition to the composite end point, the achievement of each single treatment measure was analyzed. Temporal changes were compared. Multivariate predictors of long-term medication adherence were also identified.

2.3. Statistical analysis

Descriptive analyses of evidence therapy use were performed and the data were tabulated as means or frequencies. Chi-square test for discrete variables was used to compare the rates of evidence based therapies. We showed the proportion of patients adherent to each medication by categories of first and last outpatient follow-up time at 30 days and 6 months, respectively. Patients were then categorized into 2 pre-specified groups based on adherence to guideline-concordant care. Patients were also stratified according to the index event: ST-segment elevation myocardial infarction (STEMI) versus non-ST-segment elevation ACS (NSTEMI-ACS) [13]. We used multivariate logistic regression to assess the relationship between guideline-concordant care and clinical baseline characteristics. Estimates of the odds ratios (OR) and associated 95% confidence intervals (CI) were obtained with the use of the multivariable logistic regression analysis. Constant covariates included in the analyses were: gender; age; cardiovascular risk factors: (hypercholesterolemia, history of diabetes, history of hypertension, smoking status); clinical history of ischemic heart disease (prior myocardial infarction, prior percutaneous coronary intervention [PCI], and prior coronary artery bypass graft [CABG]), clinical history of cardiovascular disorders (peripheral artery disease, prior heart failure and prior stroke), severity of clinical presentation (index event, systolic blood pressure, heart rate, and chronic kidney disease) and revascularization therapy during the index hospitalization (CABG, PCI). Secondary analyses were performed to evaluate years in the program (time frame from 2012 to 2013 and from 2014 to 2015), and guideline-concordant care categories. For all analyses, statistical significance was defined as a value of $p < 0.05$. Statistical evaluation was performed using STATA 11 (StataCorp. College Station, TX, USA).

3. Results

3.1. Demographics

A description of patient characteristics stratified by achievement of GCC at 6 month follow-up visit is reported in Table 1. Overall, 585 patients were studied. Of these patients 427 patients (73%) demonstrated achievement of GCC. Women represented one third of the overall study

population (approximately 30%). The GCC group had more patients who underwent in-hospital revascularization by PCI (69.1%) compared with patients who did not achieve GCC (25.9%). The GCC group also had more patients with STEMI with a baseline demographic of 62.3% as compared with 46.8% of patients who did not receive GCC. Other baseline demographics and clinical characteristics were similar among patients with or without GCC. One fifth of the patients ($\approx 20\%$) did not receive some of their cardiac medications at discharge. Of patients who did not GCC, $\approx 12\%$ was not given 2 medications and $\approx 0.2\%$ did not receive all 5 medications (Supplemental Fig. 1).

3.2. Quality measures

Approximately 20% of the patients did not receive at least one evidence based medication at hospital discharge (Table 2). In these patients, non-adherence to beta-blockers ACEI/ARB and clopidogrel was mostly high with further reductions for clopidogrel use seen over 6 months after discharge. At 6 months 64.4% of these patients were adherent to beta-blockers, 72.0% to ACEI/ARB and 57.7% to clopidogrel. On the opposite, when medications achieved GCC at discharge, adherence to each of the evidence-based medications over time remained high, even for beta-blockers and clopidogrel.

3.3. Logistic regression models for guideline-concordant care

After adjustment for patient characteristics, the only multivariable predictors of GCC adherence identified were referral to in-hospital revascularization by PCI and diagnosis of STEMI (Table 3). These associations persisted all throughout the follow-up. The correlations between adherence rates to an individual guideline-recommended therapy during follow up at 6 months are shown in Supplemental Table 1. Independent associations between use of individual recommended medications and baseline patients' characteristics were mainly observed for clopidogrel and ACEI/ARB. The highest clopidogrel adherence rates were seen in patients receiving in-hospital PCI and patients with STEMI. Accordingly, we found that only 28.6% of the medically managed NSTEMI-ACS patients not achieving GCC received clopidogrel prescription at discharge (Fig. 2). Adherence rates for ACEI/ARB were mainly influenced by a history of hypertension (Table 3). Adjustment for time frame (2012 to 2013 versus 2014 to 2015) did not significantly change the estimates of the overall hospital composite adherence score (GCC)

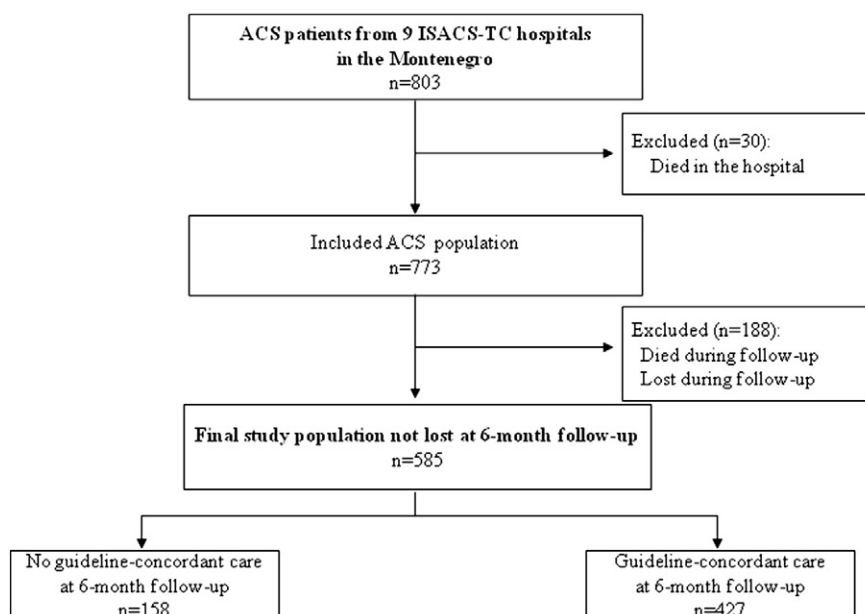


Fig. 1. Patient flow chart. ACS = acute coronary syndrome.

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