Effect of a comprehensive ambulatory care model on outcomes of patients with acute coronary syndrome in Colombia

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ABSTRACT

Objective.   *To evaluate the effect of a care program designed according to a comprehensive ambulatory care model (CACM) on the appearance of new cardiovascular/coronary events in patients with acute coronary syndrome.*

Methods.   *Participants in this quasi-experimental intervention study included acute coronary syndrome patients 30–70 years old. The intervention group (n = 165) received care under the CACM, guided by an interdisciplinary team. The CACM included transitional care, risk stratification by severity, physiological profiling (impedance cardiography), and a treatment plan in accordance with current guidelines. The control group (n = 277) received conventional, recommended care in an ambulatory cardiac rehabilitation program. During one year of follow-up, the use of emergency and hospital services related to new cardiovascular and coronary events was evaluated.*

Results.   *Differences in the numbers of cardiovascular events (P = 0.003) and coronary events (P = 0.006) experienced by patients were found between the control group and the intervention group. The instantaneous risk of a cardiovascular event (hazard ratio (HR) = 1.80; 95% confidence interval (CI): 1.17–2.75; P = 0.007) and of a coronary event (HR = 1.81; 95% CI: 1.13–2.90; P = 0.013), after adjusting for age, sex, smoking, and compromised coronary arteries, was higher in the control group than the intervention group.*

Conclusions.   *Provision of care under the CACM to patients who had experienced an acute coronary event reduced emergency room visits and rehospitalizations related to new cardiovascular and coronary events by 40%. The average "number needed to treat" (NNT) under the CACM to have an impact on one person (in this case, the prevention of one cardiovascular or coronary event), was 9 and 11 respectively, indicating it is cost-effective.*

Key words   Coronary disease; cardiovascular diseases; ambulatory care; patient readmission; cardiography, impedance; Colombia.

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Coronary heart disease is a public health problem in both developed and developing countries due to its high morbidity and mortality (1). After an acute coronary event, rehospitalization is common, and reinterventions that prolong the hospital stay are occasionally required (2). One in four patients hospitalized for an acute coronary syndrome (ACS) has further complications at discharge (3), some of which can lead to emergency room visits and preventable readmissions (4, 5).

Despite the high frequency of rehospitalizations after a coronary event, some of the procedures at the time of hospital discharge have not been standardized (6). Frequently, there are no systems to guarantee that patient information during hospitalization is transferred to those who continue to care for them (7). This situation causes doctors to discharge patients without previous preparation, to be unaware of their treatment plan, and to forget patients' principal diagnoses (8). In developed countries, transitional care has enabled the integration of networks for the provision of health services, which has translated into increased efficiency and decreases in the number of hospitalizations, preventable events, and care costs (9, 10).

Currently, transitional care is one component of comprehensive care models for patients with coronary disease that comprise multiple strategies proven to be effective individually (9, 10). These types of comprehensive care models are applied in developed countries among patients with various chronic diseases for risk management (9, 10). Despite recent technological advances in the diagnosis and treatment of patients with coronary disease in Colombia, the health system has not yet incorporated the latest developments in chronic ambulatory care, such as technological innovations that allow for early detection of decompensation, and monitoring, as well as remote follow-up and treatment of patients, to decrease hospital readmissions. Although these new strategies for ambulatory care of patients with cardiovascular disease have been shown in other countries to achieve improved quality of life, adherence to treatment, survival, and prognosis at a lower economic cost than previous models (6, 11–13), the effectiveness of these types of interventions in developing countries is unknown, justifying the development of research in this area. For this reason, the objective of this study was to evaluate the effect of care designed according to a comprehensive ambulatory care model (CACM) on the appearance of new cardiovascular/coronary events in patients with ACS. To the best of the authors' knowledge, this is the first study by health promotion agencies of patients with chronic coronary disease in Colombia receiving care under the assurance model ("EPS") and covered by Colombia's Mandatory Health Plan (Plan Obligatorio de Salud, POS) in which the effectiveness of interdisciplinary interventions on reducing rehospitalizations was demonstrated. The results provide information on how to 1) guide health interventions in this patient population and 2) implement patient-centered treatment programs for chronic diseases that achieve prevention of decompensation and stabilization of basic clinical conditions using interdisciplinary care models that have been effective in other countries (5, 14–16).

MATERIALS AND METHODS

Study design

A quasi-experimental intervention study was performed that included 442 patients who 1) had experienced an ACS, 2) were covered by local health insurer EPS SURA, and 3) had been discharged from the Cardiovid Clinic in Medellín, Colombia, between December 2008 and December 2011.

Sample selection

A minimum sample size of 435 patients was calculated based on a frequency of use of emergency services or hospitalization in the historical cohort of 30%; a relative risk (RR) of 1.6; a 2:1 ratio; a power of 80%; and a 95% confidence interval (CI) (two-tailed). Epidat 3.1 software (Regional Health Authority, Xunta de Galicia, Spain, and Pan American Health Organization, Washington, D.C., United States) was used to calculate the sample size.

Among the participants, 277 patients were assigned to a control group (historical cohort, 2008–2009) and 165 patients were admitted to the intervention group (2010–2011). The intervention group was selected during the implementation of a CACM in a cardiovascular center led by a cardiologist with a multidisciplinary team. The control group consisted of all patients with the same eligibility characteristics (discharged from the same hospital and enrolled in the same health insurer) during the year prior to implementation of the CACM. The intervention group was treated using a CACM at the Soluciones Integrales en Riesgo Cardiovascular (SICOR) Clinical and Research Center (Medellín, Colombia) and the control group received conventional care in an ambulatory cardiac rehabilitation program.

All of the subjects' prospective information related to hospitalization as a result of an acute coronary event that originated at the beginning of the observation period ("index event") was obtained from the clinical history at the Cardiovid Clinic. One of the researchers reviewed a daily list of hospitalized patients and determined their eligibility. During one year of follow-up, the use of emergency and hospital services related to new cardiovascular and coronary events was evaluated.

Subjects

Individuals between 30 and 70 years of age, diagnosed with an ACS, with or without electrocardiogram (ECG) findings corresponding to ST segment elevation or episodes of angina requiring hospitalization for a treatment plan, were included. These patients comprised individuals coming to emergency services with chest pain compatible with angina or myocardial infarction and ECG findings corresponding to ST segment elevation (two concordant and consecutive leads) or non-ST segment elevation ACS (two ECG leads with a 1-mm depression or T-wave inversion) who, according to the clinician's risk stratification, were at high risk of an ongoing acute coronary episode. In addition, ACS was confirmed when at least one positive (> 0.5 µg/L) cardiac troponin assay was present. Once the process of care for the ACS was completed, which usually included angiography with percutaneous or surgical coronary revascularization, the patient was discharged.

Exclusion criteria

Patients who were pregnant; had serum creatinine ≥ 2 mg/dL, diabetic nephropathy with overt proteinuria ≥ 1 g/24 hours, or associated cor pulmonale; exhibited cognitive disorder; or lacked a primary caregiver were excluded from the study.

Initial evaluation

A general practitioner filled out the discharge summary form, which contained demographic, clinical, and relevant laboratory information for each of the participating subjects based on the data from the clinical history of the index event. This summary of clinical history

included potential confounding variables to assess the comparability of the groups. Before beginning the study, the research team reviewed 10 case histories, chosen at random, to standardize the method of data collection.

Intervention: SICOR comprehensive ambulatory care model

The care group included a cardiologist, a doctor specialized in sports and exercise medicine, a general practitioner, a cardiopulmonary physical therapist, a nurse, and a nursing assistant specialized in cardiovascular care. All members of the care team were trained to deliver the services provided according to a detailed protocol of care manual, along with relevant clinical interactions and drug-treatment monitoring.

The head nurse coordinated the plan for scheduled ambulatory follow-up. Using the information collected in the discharge summary, an after-hospital care plan (AHCP) was designed that contained the diagnoses, the contact information for the primary caregiver, appointment dates, a list of drugs, pending diagnostic tests, and information about what to do if there were any relevant symptoms or clinical situations. A post-discharge telephone follow-up contact was made. The nurse used a learning feedback method to review the contents of the AHCP with each participant (17).

At the time of admission of each patient to the ambulatory care center, information related to socio-demographic characteristics was recorded, short questionnaires for assessing the quality of life and emotional state (based on EQ-5D™,[4] K10[5] depressive symptoms) were applied (18), and the Charlson Comorbidity Index (CCI) was calculated (19). The Global Registry of Acute Coronary Events (GRACE score)[6] was also applied to evaluate the characteristics of the acute coronary event (20). This information complemented the initial evaluation contained in the discharge summary at the time of the hospital discharge and permitted the classification of risk stratification by severity to define the treatment plan and

follow-up. Subsequently, physiological profiling was performed, a secondary prevention program designed according to existing guidelines (21, 22), plans organized for treatment adherence and therapeutic drug monitoring, educational needs evaluated, and clinical outcome indicators obtained.

During the intervention program, symptoms (angina, chest pain, dyspnoea, and/or palpitations) were monitored, and according to the individual case, patients were given access to the CACM program immediately or within 24 hours. In addition to evaluations oriented to modify the course of coronary disease and all recommended care (12, 22), risk factors and particular cardiovascular clinical situations were addressed (21, 22). To operationalize procedures, standards published by other international groups for the management of cardiovascular diseases (23) and recommendations for the development of patient-centered medical homes were applied (24).

In addition, pharmacotherapeutic adjustment was performed guided by Task Force® Monitor (CNSystems, Graz, Austria) impedance cardiography equipment (25–28). The pulse wave was analyzed with a Mobil-O-Graph® (I.E.M., Stolberg, Germany) (29). Electrocardiographic telemetry was used to evaluate the onset of symptoms with a portable device, the BEAM®ECG Mobil (I.E.M).

Conventional care

The control group received conventional care in an ambulatory cardiac rehabilitation program, but did not receive a transitional care plan, and also lacked interdisciplinary group support for psychosocial needs. They also did not have a primary care physician or a cardiologist doing a follow-up with a standardized care plan.

Monitoring and outcome measurement

For each participant, a follow-up period of one year was considered. An official from the health insurer (EPS SURA) who was independent of the research group and did not know to which group any patient belonged used an information system to measure outcomes. Index events were identified by searching the database using the patient's chart identifier plus terms for specific diagno-

ses (e.g., "myocardial infarction") and corresponding hospital services. The duration of follow-up by health providers after the index event was also recorded. Medical personnel orders given and approved for medical procedures and procedure completion were derived from the insurer's charges received from the provider and the final diagnosis consigned. The provider's name was also retrieved and included as part of the data.

The outcomes considered were the use of emergency services and hospitalization resulting from new cardiovascular and coronary events. Cardiovascular events included the following ICD-10 codes: for diabetes mellitus diagnostic groupings, codes E10, E11, E13, E14; for hypertensive disease, codes I10, I11, I12, I13, I15; for ischemic heart disease, codes I200, I201, I208, I209 and all derivatives of codes I21 and I25; for other forms of heart disease, codes I350, I420, I471, I472, I479, I48X, I500; and for signs and symptoms involving the circulatory and respiratory systems, codes R000, R001, R002, R010, R030, R040, R060, R072, R074, R092. The definition of coronary events included only category codes related to ischemic heart disease.

Ethical issues

The study was approved by the ethics committee of the health insurer (EPS SURA). Informed consent was obtained from each individual who participated in the CACM. To protect patients' identities, a coding system was developed that excluded names and citizenship identification numbers from the database. Standards for health research from Colombia's Ministry of Social Protection (Resolution #008430 of 1993) (30) and the principles of the Declaration of Helsinki were taken into account (31).
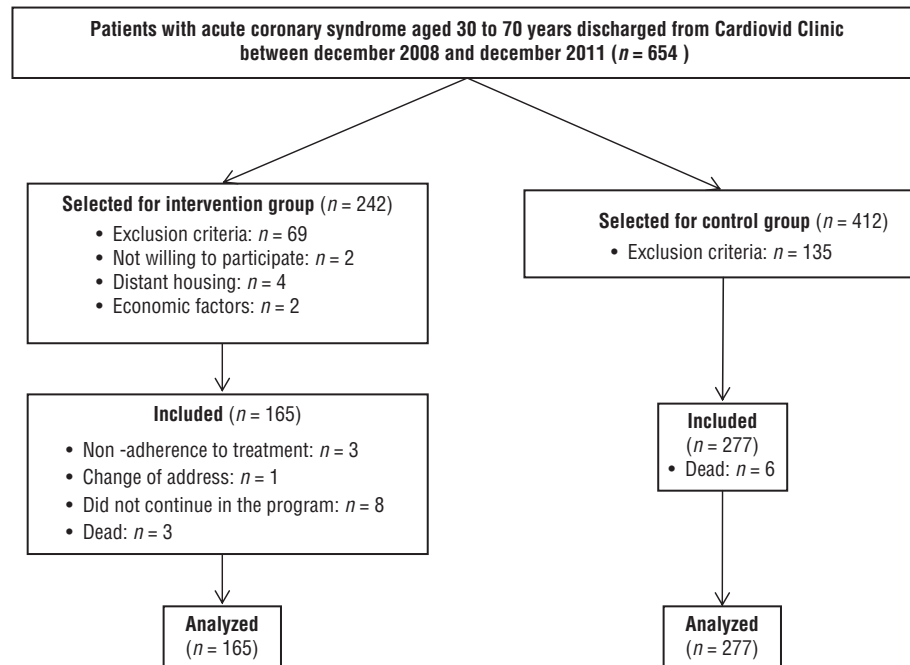
Statistical analysis

The Kolmogorov–Smirnov (K–S) test was used to assess whether the variables came from a normally distributed population. Quantitative variables are presented as means and standard deviations, medians, and interquartile ranges. Nominal variables are presented as proportions. Quantitative variables were compared between groups using either the Student's t-test or the Mann-Whitney U test depending on whether they came from a normally distributed population.

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[4] Standardized instrument for measuring mental health (EuroQol Group, Rotterdam, Netherlands).
[5] Kessler Psychological Distress Scale (Kessler R. Department of Health Care Policy, Harvard Medical School, Boston, Massachusetts, United States).
[6] Developed from a multinational registry involving all subsets of ACS.

FIGURE 1. Flowchart showing the process of inclusion of the patients participating in the study, Medellín, Colombia, December 2008–2011[a]

[a] Compiled by the authors using the study results.

Qualitative variables were compared using the χ^2 test. RR was calculated with 95% CIs, and a multivariate analysis of Cox proportional hazards was performed to adjust for potentially confounding variables. Finally, Kaplan-Meier curves were generated to evaluate the event-free survival. For all analyses, a statistical significance level of $\alpha = 0.05$ was used. All statistical calculations were performed with IBM SPSS Statistics for Windows, version 21.0 (IBM Corp., Armonk, New York, United States).

RESULTS

A total of 442 subjects (165 belonging to the intervention group and 277 belonging to the control group) were included in the analysis. Figure 1 shows the inclusion process of patients participating in the study.

The comparison of both groups in terms of demographic, clinical, laboratory, and medication use at the time of discharge showed no differences except that a history of smoking and lesions of the circumflex artery in coronary angiography were more common in the intervention group (Table 1).

Follow-up time was on average 353 days (± 48.5), with no significant difference in this period between the two groups ($P = 0.190$). During follow-up, 150 cardiovascular events, with an average of 0.34 (± 0.68), and 116 coronary events, with an average of 0.26 (± 0.59), were observed. Statistically significant differences in mean cardiovascular events (0.41 versus 0.22; $P = 0.003$) and coronary events (0.32 versus 0.17; $P = 0.006$) were found between the control group and the intervention group. The incidence rate of a first cardiovascular event and a first coronary event was higher in the control group compared to the intervention group (RR = 1.64; 95% CI: 1.12–2.39; $P = 0.008$ and RR = 1.63; 95% CI: 1.06–2.49; $P = 0.021$ respectively). The public health benefit can be quantified using the "number needed to treat" (NNT) statistical measure (the estimated average number of people that need to be treated under the model of care to have an impact on one person, defined in this case as the prevention of one cardiovascular or coronary event). In this study, the average NNT to prevent one cardiovascular or coronary event was 9 and 11 respectively (Table 2).

In the survival analysis, survival time free of a first cardiovascular or coronary event was higher in the intervention group than the control group (log-rank test; $P = 0.007$ and $P = 0.017$; respectively) (Figure 2).

In the Cox proportional hazard analysis, the hazard ratio (HR) of cardiovascular events (1.80; 95% CI: 1.17–2.75; $P = 0.007$) and coronary events (1.81; 95% CI: 1.13–2.90; $P = 0.013$) was greater in the control group than the intervention group after adjusting for age, sex, smoking history, and number of diseased coronary arteries.

DISCUSSION

The CACM that was applied in patients with coronary disease after hospitalization or percutaneous or surgical coronary intervention proved to be an effective strategy to reduce post-hospital complications. This was achieved after reducing recurrences and increasing event-free survival in the first year post-discharge. In the current study, the multidimensional model applied reduced the number and type of hospitalizations (emergency or elective) in the intervention group by 40% in the first year. Interestingly, the effects of the intervention were observed in the first days post-discharge, which affected the early rehospitalization (in the first 30 days), and the size of the effect increased with increasing follow-up time. In addition, the average NNT to prevent one cardiovascular or coronary event was 9 and 11 respectively, which is cost-effective (32). These findings emphasize the importance of an ambulatory program with high adherence to the plan of care in achieving therapeutic goals and maximizing the impact on clinical indicators.

Several studies highlight the importance of comprehensive ambulatory care models to reduce hospital readmissions and improve other clinical outcomes in patients with chronic coronary disease (5, 33, 34). The clinical impact has resulted in decreased costs of care for various chronic diseases (5, 33, 34). In several studies of coronary disease and heart failure, reductions in cost, number of hospital days, and endpoints are demonstrated when programs take into account the entire spectrum of the basic condition and associated comorbidities (35, 36).

Hannan et al. (37) found that early rehospitalizations in those who have experienced an ACS occurred as a result of chronic ischemic heart disease, chest pain, or heart failure. They also suggested that interventions be tailored to the population severity in order to target the causes of readmission. These subgroups of patients can be identified with clinical algorithms (38). Much of the success of the management models for

patients with chronic heart disease, such as the one studied in the research reported here, is derived from the facts that these interventions take the level of severity into account and involve proactive monitoring to detect early decompensation (38). Some diagnostic methods reduce rehospitalization by detecting early cardiovascular decompensation

and facilitating therapeutic adjustments (26, 27, 39). In addition, as part of cardiac rehabilitation, health interventions based on patients' self-care, which can reduce the levels of risk and avoidable hospitalizations, have been promoted (40).

In Latin America, the need persists for efficient and scalable strategies that can stabilize the condition of patients with

coronary disease in the initial phase of post-hospitalization. This study provides strong evidence of the impact of a program of this kind, demonstrating a reduction of 40% in the number of cardiovascular events during the first year in the intervention group that received the CACM.

The care plan included various activities within an interdisciplinary group that have proven to be effective, including follow-up calls (41), access to symptom assessment with an appointment on the same day, the use of impedance cardiography (26, 39), the analysis of the pulse wave (29), and telemetry (13). These activities aim to make an early assessment of symptoms, risk, and the presence of decompensation, with the help of methods that are useful in the ambulatory patients' therapeutic adjustment. Impedance cardiography is useful for making therapeutic adjustments in patients with heart failure and other clinical conditions (26, 39). These interventions were included in the study's model of care, as proposed for chronic diseases (42). The advantages of using these ambulatory methods are reflected in immediate conduct based on hemodynamic status, leading to better selection of the drugs used (27, 39).

The reduction in the risk of hospital readmission was the product of the combination of multiple individual strategies that generated adherence to the treatment plan. These included modifying habits; performing exercise; and achieving and maintaining goals for blood pressure, cholesterol, and blood glucose. Patients with a greater severity of comorbidity typically require more time to stabilize their condition and reduce the likelihood of a new event. For these patients, a strategy of collective decision-making (i.e., use of a "heart team") as treatment has been proposed (43). In addition, the research team employed methods to organize access and opportunity in the delivery of the components for a patient-centered medical home model, in a multidimensional manner.

In this investigation, in the group of patients participating in the CACM, the research team focused on the three quality indicators: 1) process; 2) structure; and 3) result (44). While the control group did not receive transitional care and also lacked interdisciplinary group support for psychosocial needs, it did receive the recommended care for a

TABLE 1. Demographic, clinical, laboratory, and medication characteristics at discharge by group, Medellín, Colombia, December 2008–2011[a]

Characteristic	Control (n = 277)	Intervention (n = 165)	P[b]
Age (years)	58.7 (± 7.3)[c]	57.7 (± 8.2)[c]	0.208
Male (%)	71.7	67.7	0.368
Hypertension (%)	69.3	62.4	0.137
Diabetes mellitus (%)	20.2	18.2	0.601
Dyslipidemia (%)	55.2	63.6	0.083
Smoking (%)	28.5	46.7	< 0.001
History of myocardial infarction (%)	14.4	11.5	0.382
Antecedent angioplasty (%)	38.6	35.2	0.465
Antecedent bypass (%)	12.6	11.5	0.728
Number of days of hospitalization	4.7 (± 4.6)	4.6 (± 4.4)	0.776
Systolic blood pressure (mmHg)	136.4 (± 24.3)	137.3 (± 23.5)	0.827
Diastolic blood pressure (mmHg)	78.1 (± 13.6)	78.9 (± 12.3)	0.733
Heart rate (bpm)	72.4 (± 13.7)	73.7 (± 14.3)	0.611
Left ventricular ejection fraction (%)	50.0 (± 11.4)	47.8 (± 10.3)	0.082
Total cholesterol (mg/dL)	184.3 (± 45.7)	199.6 (± 45.0)	0.061
Triglyceride (mg/dL)	220.8 (± 194.9)	220.8 (± 110.1)	0.999
High-density lipoprotein cholesterol (mg/dL)	37.1 (± 8.7)	38.1 (± 10.4)	0.590
Coronary catheterization (%)	85.9	91.5	0.080
Angioplasty (%)	60.3	61.2	0.848
Bypass (%)	15.2	16.4	0.736
Left main coronary artery compromise (%)	5.0	7.3	0.361
Anterior descending artery compromise (%)	40.8	43.7	0.565
Right coronary artery compromise (%)	29.0	38.4	0.054
Circumflex artery compromise (%)	26.9	36.4	0.047
Diagnosis of unstable angina at discharge (%)	28.9	28.5	0.929
Diagnosis of NSTEMI[d] at discharge (%)	23.1	28.5	0.207
Diagnosis of STEMI[e] at discharge (%)	22.0	19.4	0.512
Diagnosis of heart failure at discharge (%)	2.5	3.6	0.504
Acetylsalicylic acid (%)	94.9	90.3	0.061
Clopidogrel (%)	62.5	64.8	0.613
Beta blockers (%)	86.6	84.8	0.599
Angiotensin-converting enzyme inhibitors (%)	58.1	59.4	0.793
Angiotensin II receptor blockers (%)	17.3	20.6	0.391
Statins (%)	90.3	87.3	0.330

[a] Compiled by the authors using the study results.
[b] Pearson's chi-squared test (χ^2) for categorical data and Student's t-test or Mann-Whitney U test for quantitative variables, depending on whether they came from a normally distributed population.
[c] Data are presented as mean ± SD when appropriate.
[d] NSTEMI: non–ST-elevation myocardial infarction.
[e] STEMI: ST-elevation myocardial infarction.

TABLE 2. Comparison of cardiovascular and coronary events during follow-up: intervention group versus control group, Medellín, Colombia, December 2008–2012[a]

Event	Control (n = 227) %	Intervention (n = 165) %	RR[b]	95% CI[c]	ARR[d] %	NNT[e]	P[f]
Cardiovascular	28.9	17.6	1.64	1.12–2.39	11.3	9	0.008
Coronary	23.8	14.6	1.63	1.06–2.49	9.2	11	0.021

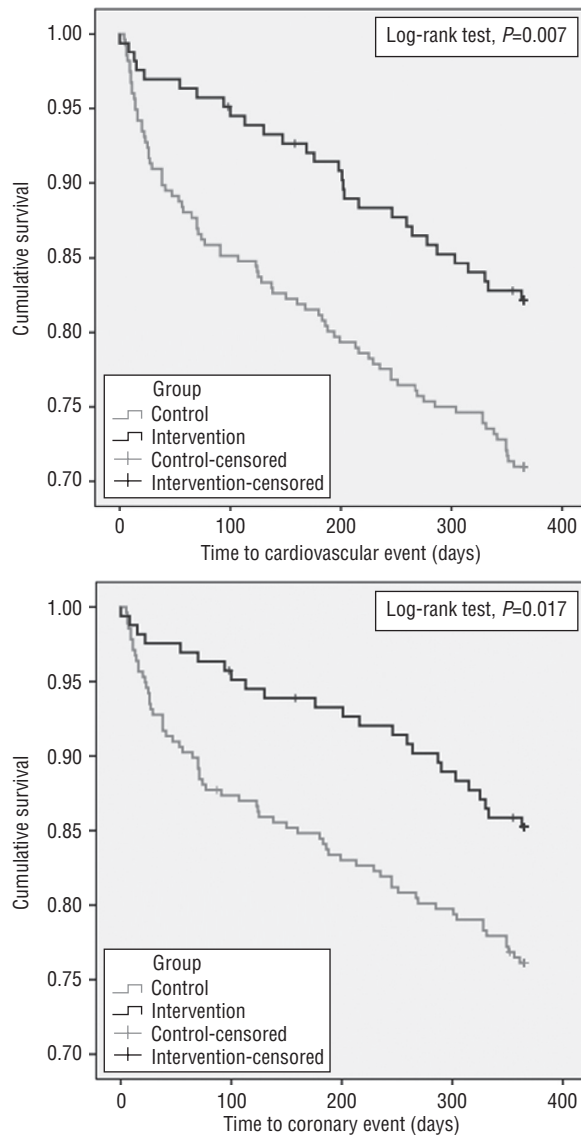[a] Compiled by the authors using the study results.
[b] RR: relative risk.
[c] CI: confidence interval.
[d] ARR: absolute risk reduction.
[e] NNT: number needed to treat (to prevent one cardiovascular/coronary event).
[f] Pearson's chi-squared test (χ^2).

FIGURE 2. Kaplan-Meier survival curves for cardiovascular (top) and coronary events: control group and intervention group, Medellín, Colombia, December 2008–2012[a]

[a] Compiled by the authors based on the study results.

in health care delivery in Colombia. In real-world circumstances, Colombian health providers design the models of care to maximize value for resources spent in their contracts with insurers. Insurers, on the other hand, search for provider value propositions that yield better health outcomes at the same or lower costs. Therefore, this study was designed to ascertain if both parties achieved the expected impact rather than as a means of analyzing the effect of the CACM alone. Second, there was some risk of selection bias in the study sample. During the CACM implementation period, two patients refused to participate, six were excluded before the CACM program began, and eight dropped out after it started. Although the changes in the number of study participants were small, they could have affected the results in a way that the authors did not explicitly control for. In addition, the insurer's contracting policies could have changed between the pre-intervention and intervention periods (e.g., the insurer might have decided to concentrate patients from a certain geographic area at Cardiovid Clinic, directing patients from other areas to other providers), changing the characteristics of the two study samples. The authors did not explicitly control for these potential sources of bias. Third, differences in unmeasured characteristics could have influenced the results. The numbers in Table 1 show that both groups were similar, at least in terms of the most relevant biomedical indicators. However, the authors cannot rule out differences between the two groups in unmeasured characteristics such as motivation to adhere to treatment, literacy, and individual preferences.

Conclusions

Use of a CACM to guide care of patients who have experienced an acute coronary event reduces emergency room visits and rehospitalizations related to the occurrence of new cardiovascular and coronary events by 40%. The average "number needed to treat" under the CACM to have an impact on one person (in this case, the prevention of one cardiovascular or coronary event), was 9 and 11 respectively, indicating the CACM is cost-effective.

subsequent coronary event (12, 22), and was referred to an ambulatory cardiac rehabilitation program, and therefore could not be considered a group without optimal treatment. The recommended care program included smoking cessation counseling, nutritional counseling, and participation in cardiac rehabilitation programs, in accordance with recommended treatment in secondary prevention plans of the health insurer. Consequently, patients in the control group were also admitted to cardiac rehabilitation, which in principle would make it difficult to show any difference between the two groups. Therefore, the comprehensive monitoring of the intervention group included evaluation of other components, such as the affective state and its modification; assessment and intervention of social determinants of the health of the individual; and measurements of the quality of life and its clinical impact (18).

Limitations

This study had some limitations. First, use of an experimental study design to better isolate the effect of the intervention (the CACM) was not possible due to the nature of payer–provider relationships

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RESUMEN

Efecto de un modelo integral de atención ambulatoria sobre los resultados en pacientes con síndrome coronario agudo en Colombia

Objetivo. Evaluar el efecto de un programa de atención diseñado según un modelo integral de atención ambulatoria (MIAA) en la aparición de nuevos episodios cardiovasculares o coronarios en pacientes con síndrome coronario agudo.

Métodos. Como participantes en este estudio de intervención cuasiexperimental se incluyó a pacientes con síndrome coronario agudo de 30 a 70 años de edad. El grupo de intervención (*n* = 165) recibió atención mediante el MIAA, guiada por un equipo interdisciplinario. El MIAA incluyó la atención transitoria, la estratificación del riesgo según la gravedad, la realización de pruebas fisiológicas (cardiografía de impedancia) y un plan de tratamiento conforme con las directrices actuales. El grupo de referencia (*n* = 277) recibió la atención convencional recomendada en un programa ambulatorio de rehabilitación cardíaca. Durante el año en que se llevó a cabo el seguimiento, se evaluó el uso de los servicios de urgencia y hospitalarios relacionados con nuevos episodios cardiovasculares y coronarios.

Resultados. Se observaron diferencias en el número de episodios cardiovasculares (*P* = 0,003) y episodios coronarios (*P* = 0,006) experimentados por los pacientes del grupo de referencia y el grupo de intervención. El cociente de riesgo instantáneo de un episodio cardiovascular (HR = 1,80; IC de 95%: 1,17–2,75; *P* = 0,007) y de un episodio coronario (HR = 1,81; IC de 95%: 1,13–2,90; *P* = 0,013), tras ajustar para la edad, el sexo, el tabaquismo y las arterias coronarias afectadas, fue mayor en el grupo de referencia que en el grupo de intervención.

Conclusiones. La prestación de atención mediante el MIAA a los pacientes que habían experimentado un episodio coronario agudo redujo en 40% las visitas a servicios de urgencia y las rehospitalizaciones relacionadas con nuevos episodios cardiovasculares y coronarios. El número promedio de pacientes "que es necesario tratar" mediante el MIAA para que tenga repercusión en uno de ellos (en este caso, la prevención de un episodio cardiovascular o coronario), fue de 9 y 11 respectivamente, lo que indica que la intervención es eficaz en función de los costos.

Palabras clave

Enfermedad coronaria; enfermedades cardiovasculares; atención ambulatoria; readmisión del paciente; cardiografía de impedancia; Colombia.