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Comparison of two Registries of Acute Coronary Syndrome in Argentina: STRATEG-SIA and SCAR (1999 – 2011)

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Comparación de dos Registros de Síndrome Coronario Agudo en Argentina: STRATEG-SIA y SCAR (1999 – 2011).

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ABSTRACT

Background: The influence of clinical evidence on strategies implemented in the treatment of non-ST-segment elevation acute coronary syndromes (NSTEACS) is not known in our setting.
Objectives: The aim of this study was to evaluate the differences in clinical characteristics, strategies adopted, therapeutic management and in-hospital events of NSTEACS in participating centers from two registries in Argentina.
Methods: Patients included in participating centers of the STRATEG-SIA registry (1999) and SCAR registry (Síndromes Coronarios Agudos en Argentina - 2011) were compared.
Results: We analyzed 238 patients of the STRATEG-SIA registry and 452 of the SCAR registry in 36 centers. Most patients were men and <65 years (SCAR 57%, STRATEG-SIA 54%; p=ns). The SCAR group presented higher prevalence of hypertension (75% vs. 60%; p=0.001), dyslipidemia (63% vs. 51%; p=0.003), chronic heart failure (10.5% vs. 4.6%; p=0.02) and history of myocardial revascularization (30% vs. 17%; p=0.001). In the SCAR registry, the proportion of moderate and high-risk patients (TIMI risk score 3-4: 48% vs. 37%; 5-7: 18% vs. 8%; p=0.0001) was higher and coronary angiography was more frequent (71% vs. 50%; p=0.0001), with a twofold increase in the proportion of percutaneous coronary interventions and 50% reduction in the number of myocardial revascularization surgeries. There were no significant differences in the rate of mortality and myocardial infarction during hospitalization (7.2% vs. 5.9%; p=ns).
Conclusions: Patients of the SCAR (2011) registry represent a group at higher risk. The differences in the rates of in-hospital events were not statistically significant.

Key words: Acute Coronary Syndrome - Registries - Coronary Artery Disease

RESUMEN

Introducción: En nuestro medio se desconoce cuál ha sido la influencia de la evidencia clínica sobre las estrategias implementadas en el tratamiento de los síndromes coronarios agudos sin elevación del segmento ST (SCASEST).
Objetivos: Evaluar la variación de las características clínicas, las estrategias adoptadas, las conductas terapéuticas y los eventos hospitalarios de los SCASEST en centros que participaron en dos registros realizados en la Argentina.
Material y métodos: Se compararon pacientes incluidos en centros que participaron en los registros STRATEG-SIA (1999) y SCAR (Síndromes Coronarios Agudos en Argentina - 2011).
Resultados: Se analizaron 238 pacientes del registro STRATEG-SIA y 452 del SCAR incluidos en 36 centros. La mayoría eran de género masculino y menores de 65 años (SCAR 57%, STRATEG-SIA 54%; p=ns). El grupo SCAR presentó mayor prevalencia de hipertensión arterial (75% vs. 60%; p=0,001), dislipidemia (63% vs. 51%; p=0,003), insuficiencia cardíaca crónica (10,5% vs. 4,6%; p= 0,02) y revascularización coronaria previa (30% vs. 17%; p=0,001). Con una proporción mayor de puntaje TIMI de riesgo moderado y alto (3-4: 48% vs. 37%; 5-7: 18% vs. 8%; p=0,0001), la coronariografía fue más frecuente en el SCAR (71% vs. 50%; p=0,0001), duplicándose la angioplastia coronaria y reduciéndose a la mitad las cirugías de revascularización miocárdica. No hubo diferencias significativas en la tasa intrahospitalaria de muerte e infarto (7,2% vs. 5,9%; p=ns).
Conclusiones: Los pacientes del registro SCAR (2011) representan un grupo de mayor riesgo. Las diferencias en las tasas de eventos hospitalarios no fueron estadísticamente significativas.

Palabras clave: Síndromes coronarios agudos - Registros - Enfermedad de la arteria coronaria

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Abbreviations

CA	Coronary angiography.	**MI**	Myocardial infarction
CABGS	Coronary artery bypass graft surgery	**NSTEACS**	Non-ST segment elevation acute coronary syndrome

INTRODUCTION

Cardiovascular disease is the most relevant health care problem in developed countries. (1, 2) According to the World Health Organization, cardiovascular disease represents the leading cause of morbidity and mortality worldwide, accounting for 16% of deaths in developed countries and 12% in developing or underdeveloped countries. (3) Despite identifying and treating cardiovascular risk factors as smoking, cholesterol levels, blood pressure, diabetes and body weight have significantly reduced the incidence of mortality and myocardial infarction (MI), the prevalence of ischemic events related to disease progression is still important. (4, 5)

Different registries have reported that unstable angina is the leading cause of hospitalization due to coronary artery disease in our country. (5-8) The explosive development of innovative technologies and drugs, and the implementation of new strategies for diagnosis and treatment has generated not only a con-stant review of the management adopted but also an update of the national and international guidelines and recommendations. (9-12) However, the impact in our setting has not been consistently evaluated.

The goal of this analysis was to compare the differences in the clinical characteristics, management strategies and rate of in-hospital events in patients with non-ST-segment elevation acute coronary syndrome (NSTEACS) enrolled in centers participating in two registries performed with a 12-year difference (STRATEG-SIA in 1999 and SCAR in 2011).

METHODS

This comparative analysis of non-ST-segment elevation acute coronary syndromes was performed by members of the Research Area and of the Council on Cardiovascular Emergency Care of the Argentine Society of Cardiology. Patients were enrolled in 36 nationwide centers which had participated in both registries.

The STRATEG-SIA registry was developed between

Table 1. Baseline characteristics of both populations

Variable	STRATEG-SIA	SCAR	p
Age, years	64 (55-74)	66 (56-73)	ns
Female gender, n (%)	29 (68)	26.3 (119)	ns
Diabetes, % (n)	24 (57)	23.9 (108)	ns
Smoking habits, n (%)	35.7 (85)	39.4 (178)	ns
Dyslipidemia, n (%)	51 (121)	63 (285)	0.003
Hypertension, n (%)	60 (143)	75 (339)	0.001
Previous heart failure, % (n	4.6 (11)	10.5 (47)	0.02
Previous myocardial revascularization, % (n)	17 (40)	30 (136)	0.001
Chronic stable angina, % (n)	34 (81)	12 (54)	0.001

Fig. 1. Distribution of the population by TIMI risk score
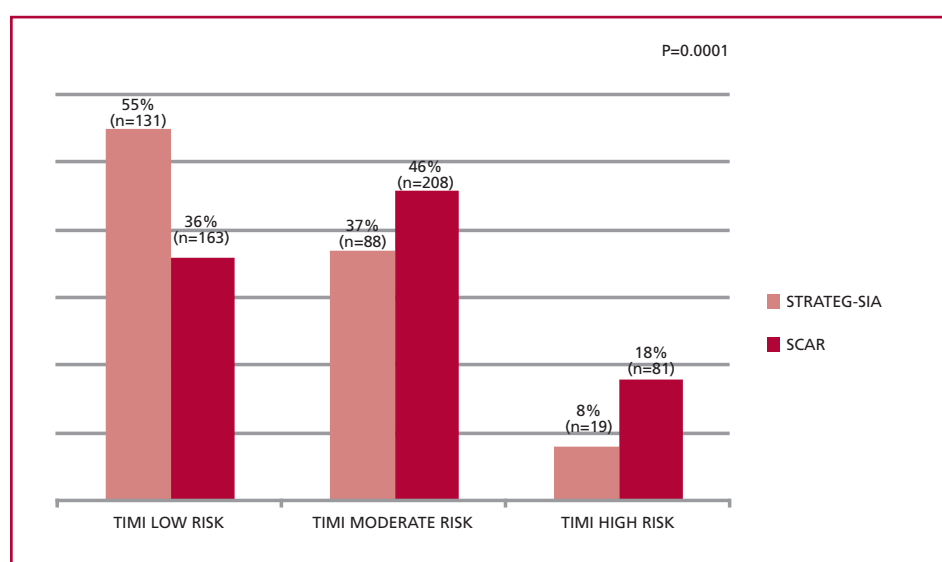
Variable	STRATEG-SIA	SCAR	p
Patients studied with CA, n	116	310	
Reason			
High-risk at admission, % (n)	32 (38)	50 (156)	ns
Recurrent ischemia, % (n)	22 (26)	9 (29)	< 0.001
Positive functional test, % (n)	22 (26)	9 (29)	< 0.04
Medical decision, % (n)	14 (17)	19 (59)	ns
PCI <6 months, % (n)	0 (0)	3 (9)	ns
Diagnosis, % (n)	5 (6)	0 (0)	ns
Only positive troponin, % (n)	0 (0)	7.4 (23)	ns
No data, % (n)	5 (3)	2.6 (5)	ns

Table 2. Reasons for indicating coronary angiography

CA: Coronary angiography. PCI: Percutaneous coronary intervention.

	STRATEG-SIA	SCAR	p
Mortality and AMI, % (n)	5.9 (14)	7.2 (32)	0.23
Mortality, % (n)	1.7 (4)	3.5 (16)	0.18
AMI and reinfarction, % (n)	5 (12)	3.8 (17)	0.43
Refractory angina, % (n)	7.1 (17)	1.2 (5)	0.0001
Recurrent angina, % (n)	20.2 (48)	10.2 (46)	0.0001

Table 3. Comparison of the rate of events in both registries

AMI: Acute myocardial infarction.

March and September 1999. The registry included 492 patients from 77 institutions with the goal of making a situational diagnosis of the strategies used for the management of patients with NSTEACS in Argentina, defining the factors associated and/or the determinants which influence decision-making, and to know their impact. (6)

The SCAR registry was performed between June and August 2011 with the participation of 87 centers including 868 patients with NSTEACS.

Inclusion criteria for the analysis
The patients included were enrolled in centers participating of the STRATEG-SIA and SCAR registries with a final diagnosis of NSTEACS. In order to attenuate the biases arising while comparing patients enrolled in two registries during two different periods, the same inclusion criteria and exclusion criteria of the STRATEG-SIA were used. In the same sense, the same definitions of coronary risk factors (diabetes, hypertension, high cholesterol levels and smoking habits) and of in-hospital events as myocardial infarction (using the definition of the World Health Organization) of the STRATEG-SIA registry were applied to the database of the SCAR registry. (6)

Study design
Both registries (STRATEG-SIA and SCAR) were cross-sectional observational studies which enrolled consecutive patients with NSTEACS. A comparative model adjusted for the type of center was used for this analysis. The patients were categorized in tertiles according to the TIMI risk score: low risk (0-1), moderate risk (2-4) and high risk (TIMI 5-7). (13)

Statistical analysis
The distribution of continuous variables was evaluated with the Kolmogorov-Smirnov test, with measurement of kurtosis and skewness. Continuous variables were presented as mean±standard deviation, or median and interquartile range (IQR 25-75), according to their distribution. Comparisons were made using Student's t test and ANOVA, or the Mann-Whitney-Wilcoxon test, as applicable.

Discrete variables were expressed as percentages, and were compared using the chi square test. A two-tailed p value < 0.05 was considered statistically significant. All the statistical analyses were performed using SPSS 19.0 statistical package for Windows (SPSS-IBM, 2010, IL, US).

Ethical considerations
The protocol was approved by SAC's Ethics Committee. As no personal or follow-up data were required, it was not necessary to include an informed consent in the registry, in accordance to the National Habeas Corpus Act Number 25326 (Protection of Personal Data).

RESULTS
Population characteristics
The database consisted of 690 patients, 452 SCAR registry patients and 238 STRATEG-SIA patients, which fulfilled the criteria to be incorporated in the analysis of 36 centers participating in both studies.

Table 1 shows baseline population characteristics. Median age was similar in both studies: 64 years (55-74) in the STRATEG-SIA registry and 66 years (56-73) in the SCAR registry. The proportion of patients >65 years was also similar: 46% in the STRATEG-SIA registry vs. 43% SCAR registry (p=ns). There were no significant gender differences between both registries.

The patients enrolled in 2011 had higher prevalence of hypertension, dyslipidemia, heart failure and history of myocardial revascularization. The patients enrolled in the 1999 registry had higher prevalence of chronic stable angina. The characteristics of both populations were not significantly different from those reported by international NSTEACS registries. (14-17)

ST-segment depression was more frequent in patients enrolled in 2011 (25% vs. 18%; p=0.05). There were no statistically significant differences in the other electrocardiographic abnormalities. A high TIMI risk score was more common in patients of the SCAR registry (TIMI 0-2: 36% vs. 55%; TIMI 3-4: 46% vs. 37%; TIMI 5-7: 18% vs. 8%; p=0.0001) (Figure 1).

Treatment
Anticoagulant therapy (heparin) was more commonly used in the SCAR registry [328/452 patients (72.5%)] than in the STRATEG-SIA registry [123/238 patients (51.6%); p=0.001] with a greater use of low-molecular-weight heparin [SCAR: 268/328 patients (81.7%); STRATEG-SIA: 56/123 patients (45.5%); p=0.002)].

In both registries, high risk at admission was the most frequent indication of coronary angiography (CA) increasing from 33% in the STRATEG-SIA registry to 50% in the SCAR registry. Recurrent ischemia and a high-risk functional test were the second most frequent indications in the STRATEG-SIA registry while medical team decision was the second reason in the SCAR registry(Table 2).

In 1999, one out of every two patients underwent CA, and by 2011 the procedure was performed to almost three out of every four patients (STRATEG-SIA 50%; SCAR 71%; p=0.0001). During the same period, the comparison between both registries showed a significant reduction in the implementation of coronary artery bypass graft surgery (CABGS)(13% vs. 7.5%, p=0.0001) and the rate of percutaneous coronary interventions evidenced a two fold increase (22% vs. 45%; p=0.0001).

The incidence of recurrent and refractory angina was significantly lower in the SCAR versus the STRATEG-SIA registry. There were no significant differences in the incidence of other cardiovascular events (Table 3)

DISCUSSION
The present analysis compares demographic and clinical characteristics, diagnostic and therapeutic management and the outcome of NSTEACS in patients enrolled in the participating centers of two registries conducted by the Argentine Society of Cardiology in 1999 and 2011.

After 12 years, the demographic pattern of the population studied does not seem to be significantly different; most patients are still middle-aged men. However, the prevalence of some cardiovascular risk factors, particularly hypertension and dyslipidemia, seems to be higher. Probably, this finding could be at-tributed to a greater capability of detecting these factors in the population, as it happened with surveys performed by the National Ministry of Health. (18, 19)

The patients enrolled in the SCAR registry had history of higher cardiovascular risk and presented with a more severe ischemic risk.

The diagnostic and therapeutic management was more aggressive in the SCAR registry, and the use of anticoagulation therapy was more common, particularly with low-molecular-weight heparins. This approach is consistent with the one reported by large international multicenter registries. The indication of invasive treatment was higher and also similar to the rate indicated by international reports. (15-17, 20)

Interestingly, percutaneous coronary intervention was the treatment of choice, and the indication of CABGS was lower than in 1999.

The first reason to indicate CA was high clinical risk at admission in both registries. The second reason was recurrent ischemia or high-risk functional test in the STRATEG-SIA registry, and decision of the medical team in the SCAR registry (see Table 2).

There were no significant differences in terms of mortality, myocardial infarction or reinfarction between both registries.

Study limitations
The presence of differences in the indication of procedures or the absence of differences in mortality in observational studies cannot be considered definitive, particularly when the analysis was not adjusted due to the low number of events

CONCLUSIONS
The burden of coronary risk factors and of history of heart disease associated with a higher prevalence of moderate and high TIMI risk score would indicate that the risk of patients enrolled in the SCAR registry was higher.

The diagnostic and therapeutic approach was different in the period between both registries.

Coronary angiography increased with a two-fold rise in the number of percutaneous coronary interventions and a reduction in the number of patients undergoing CABGS that is similar to the most recent clinical evidence.

Despite the risk profile was different in both populations, the differences in the rate of in-hospital events were not significant.

Conflicts of interest
None declared
(See author´s conflicts of interest forms in the web / Supplementary Material)

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