

Non-ST-Segment Elevation Acute Coronary Syndrome (NSTEMI-ACS) Patient Characteristics Admitted to the Coronary Care Unit of Hospital Provincial Neuquén

Características de pacientes hospitalizados en Unidad Coronaria del Hospital Provincial Neuquén por síndrome coronario agudo sin elevación del segmento ST (SCASEST)

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ABSTRACT

Background: Acute coronary syndromes (ACS) are part of the clinical presentation spectrum of coronary heart disease, and patients presenting with these syndromes constitute a heterogeneous population in which prognosis differs according to clinical and laboratory variables.

Objective: The aim of this study was to describe the clinical characteristics of patients with non-ST-segment elevation acute coronary syndrome (NSTEMI-ACS) who were admitted to Hospital Provincial Neuquén (HPN) coronary care unit (CCU) from 2017 to 2019.

Methods: This was an observational, retrospective, longitudinal and single-center study of patients hospitalized in HPN CCU between January 1, 2017 and December 31, 2019. Data collected from the epicrisis and medical records were used. Six months after hospital discharge, a new contact was made to corroborate data on mortality after the event.

Results: A total of 107 patients diagnosed with NSTEMI-ACS, with mean age of 62.2 ± 10.51 years (65.4% male gender) were included in the study. Among them, 45.8% were smokers and 46.7% had comorbidities, the most prevalent being hypertension (69.2%) and diabetes mellitus (36.4%). In 35.5% of cases, patients had a previous heart attack, 7.5% heart failure, 85% received anti-ischemic therapy, 35.5% vasodilator treatment, 70.1% required coronary angiography, 91.6% presented positive high-sensitivity troponin levels and 22.4% required coronary stent placement. The most frequent lesion corresponded to the anterior descending artery in 12.1% of patients.

Conclusions: The most prevalent characteristics of patients with NSTEMI-ACS, as well as the clinical presentation and risk of in-hospital mortality, were similar to those reported by other centers.

Key words: Acute Coronary Syndrome – Acute Coronary Syndrome without ST elevation – Intrahospital Mortality – Cardiovascular Risk

RESUMEN

Introducción: Los síndromes coronarios agudos (SCA) son parte del espectro de presentación clínica de la enfermedad coronaria, y estos pacientes constituyen una población heterogénea en la cual el pronóstico difiere según las variables clínicas y de laboratorio.

Objetivo: Describir las características clínicas de los pacientes con síndrome coronario agudo sin elevación del segmento ST (SCASEST) que ingresaron a la Unidad Coronaria (UCO) del Hospital Provincial Neuquén (HPN) en el período 2017-2019.

Métodos: Estudio observacional, retrospectivo, longitudinal y unicéntrico de pacientes hospitalizados en UCO del HPN entre 1 de enero de 2017 y 31 de diciembre de 2019. Se utilizaron datos recabados de las epicrisis e historias clínicas. A 6 meses del egreso hospitalario, se realizó un nuevo contacto para corroborar datos sobre la mortalidad posterior al evento.

Resultados: se registraron 107 pacientes con diagnóstico de SCASEST, con edad promedio de $62,2 \pm 10,5$ años (65,4% de sexo masculino). El 45,8% era tabaquista y el 46,7% presentaba comorbilidades, siendo las más prevalentes la hipertensión arterial (HTA, 69,2%) y la diabetes Mellitus (DM, 36,4%). El 35,5% tenía infarto previo, y el 7,5% insuficiencia cardíaca. El 91,6% presentó Troponinas Ultrasensibles (T-us) positivas; el 85% recibió terapia antiisquémica, el 35,5% tratamiento vasodilatador y el 70,1% fue sometido cinecoronariografía (CCG). El 22,4% requirió la colocación de al menos 1 stent coronario. La lesión más prevalente fue de la Arteria Descendente Anterior (ADA) en 12,1%.

Conclusiones: Las características más prevalentes de los pacientes con SCASEST en nuestro centro, así como la presentación clínica y el riesgo de mortalidad intrahospitalaria (MIH) fueron similares a los reportados en otros centros.

Palabras claves: Síndrome Coronario Agudo – Síndrome Coronario Agudo Sin Elevación Del ST – Mortalidad Intrahospitalaria – Riesgo Cardiovascular

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INTRODUCTION

Ischemic heart disease is still the main cause of death worldwide. Acute coronary syndromes (ACS) are part of the clinical presentation spectrum of coronary heart disease and patients presenting with these syndromes constitute a heterogeneous population in which the diagnosis differs according to clinical and laboratory variables. (1)

Acute coronary syndromes involve acute myocardial infarction (AMI) with or without ST-segment elevation, with or without Q wave, and unstable angina (UA). (2) While ST-segment elevation AMI (STEMI) is at present a clear pathophysiological entity with established treatment strategies, UA and non-ST-segment elevation AMI (NSTEMI) have been grouped under different names and are currently defined as non-ST-segment elevation ACS (NSTE-ACS). (3)

Based on the information of recent ACS registries in our country, we assume that the number of NSTE-ACS is markedly higher than that of ST-elevation ACS (STE-ACS). Gagliardi et al. published the EPI-Cardio registry in which they detected 2855 patients with STE-ACS (37.96%) and 4667 with NSTE-ACS (62.04%). (4) The recently published EPICOR study shows 40.64% of patients with STE-ACS and the rest with NSTE-ACS. (5) The two cited registries were performed in different public, private and university center networks. Since 31 425 patients with STE-ACS were estimated from data of a population registry in Argentina, it is probable that a clearly higher number is hospitalized with NSTE-ACS per year. (6)

In response to the need of adjusting treatment as a function of the individual risk of adverse cardiovascular outcomes, predictive systems such as the Global Registry of Acute Coronary Events (GRACE) scales have been developed. (7-9) The high prevalence of coronary risk factors and worldwide population ageing are two aspects that have increased AMI mortality in the last years.

Identifying the different factors associated with increased mortality risk for AMI has helped to develop diverse scores or scales to stratify risk in these patients. (10)

Consequently, to understand the current reality regarding the way to approach NSTE-ACS, an epidemiological study was carried out in a small, developing coronary care unit (CCU) (10 beds) of the highest complexity center of the city of Neuquén [Hospital Provincial de Neuquén (HPN)], with data obtained from patients hospitalized during a 2-year period and their corresponding death risk stratification.

We considered it was highly relevant to obtain data that allows local casuistry evaluation to improve working methods and the self-evaluation of the health teams that are employed in this labor, and also to serve as parameter for other institutions in the same situation.

METHODS

This was an observational, retrospective, longitudinal, single-center study of patients hospitalized in HPN CCU per-

formed by a research group from the Internal Medicine and Cardiology Division of HPN between January 1, 2017 and December 31, 2019.

It should be mentioned that the patients included in the study were admitted to a small CCU, with a fully developing hemodynamics service. Data were collected from the epicrisis and completed with information from the clinical histories.

Six months after discharge, a new telephone or in-person contact was made to confirm data on mortality after the event.

The inclusion criteria were:

Patients admitted to CCU during the period between January 2017 and December 2019, who fulfilled NSTE-ACS diagnostic criteria: chest pain in the last 48 hours, associated with high-sensitivity troponin (hs-Tn) levels above the 99 percentile, or electrocardiographic changes compatible with ischemia, defined as T-wave inversion, ST-depression >1 mm or transient ST elevation (less than 20 minutes) on discharge.

The exclusion criteria were:

- Patients with UA clinical diagnosis requiring hospitalization, but with negative troponins.
- Patients with ACS diagnosis and electrocardiogram compatible with STE-ACS.
- Patient self-discharge.

Cardiovascular risk factors and relevant clinical history were obtained from patient interrogation on hospital admission. History of hypertension (HTN), diabetes mellitus (DM), dyslipidemia, smoking (active or passive, current or past), alcohol consumption, relevant medical history and cardiovascular history were assessed.

The following variables were considered:

- Admission heart rate
- Admission blood pressure
- Admission serum creatinine
- Admission Killip and Kimball classification
- ECG with acute ischemic signs: presence of electrocardiographic abnormalities suggesting acute ischemia during the course of hospitalization
- Echocardiogram with acute ischemic signs: presence or absence of echocardiographic signs of acute ischemia in in-hospital evaluations
- Anti-ischemic therapy: need for anti-ischemic therapy in hospitalized patients (nitrates, aspirin, beta-blockers, calcium antagonists, oxygen).
- Vasodilator therapy: need for specific nitrate use during the acute NSTE-ACS period
- Positive troponins: Troponin elevations considered clinically relevant according to their cut-off point and the clinical context of NSTE-ACS
- Need for coronary angiography (CA) during hospitalization
- CA findings
- Need for coronary stent placement
- Length of stay in CCU
- Percentage of risk according to the GRACE score: Mortality risk category 6 months after discharge according to the GRACE score.

Statistical analysis

Data were collected in an online Kobotoolbox database and analyzed using SPSS 21 statistical package. Qualitative variables were described as frequencies and percentages, and mean and standard deviation were calculated for quantitative variables. Parametric or non-parametric variable distri-

bution was established using the Kolmogorov-Smirnov or Shapiro Wilk tests.

Results were expressed as percentages, means (with standard deviation) and medians [with interquartile range (IQR)].

Ethical considerations

Patient informed consent was waived as usual medical practices of the center were respected, without interventions. Data were automatically anonymized upon being sent to the coordinating center.

RESULTS

A total of 107 patients with NSTEMI-ACS diagnosis and mean age of 62.2 ± 10.5 years (65.4% male) were admitted to HPN CCU between January 2017 and December 2019. In 45.8% of cases patients referred current or prior tobacco smoking and 46.7% presented comorbidities, the most prevalent being HTN (69.2%) and DM (36.4%). Among these patients, 35.5% had previous infarction and 7.5% presented history of heart failure (Table 1).

In-hospital evolution

Median hospital stay was 3 days (IQR 2-4). Seventy-two percent of patients presented with angina, and almost all individuals were included in Killip and Kimball class I. Also, 65.4% of patients had electrocardiographic signs of acute ischemia, with T wave abnormalities as the most frequent manifestation in 38.3% of cases, and 32.7% showed echocardiographic changes compatible with acute ischemia.

Positive hs-Tn levels were found in 91.6% of patients during the acute phase and diagnosed as NSTEMI, 85% of cases received anti-ischemic therapy, 35.5% required specific treatment with vasodilators, 70.1% underwent CA during hospitalization and only 22.4% required stent placement (Table 2). The most

frequently involved artery was the anterior descending artery, in 12% of the patients (37.3% of the lesions found).

Only 12.1% of patients were at high risk (>3%) of in-hospital mortality (IHM) estimated with the GRACE score. The mean GRACE score was 133.8 ± 52.1 . However, none of the patients died during hospitalization. Table 3 shows the remaining risk categories.

DISCUSSION

The present work allows understanding the characteristics of patients admitted and discharged from HPN CCU, consisting of approximately 10 beds and a fully developing hemodynamics service. It also shows the wide spectrum of NSTEMI-ACS presentation and analyzes the diagnostic and therapeutic strategies used. Although the total number of patients in our work is not equivalent to that in other reports, we consider that it is not negligible with respect to the number of beds in our center.

Compared with the study by Costabel et al., their average age of event occurrence coincided with our mean age of 62 years, as well as its more frequent presentation in the male gender in 70% of patients. (11), also similar to other reports in the literature. Regarding comorbidities, comparable data were also found for the prevalence of prior DM and AMI, close to 30%. History of HTN prevailed in our population, with almost 70% of cases, as well as smoking, similar to the study by Mauro et al. (12)

Length of hospital stay for this condition is usually short, and in our study, it was 3 days, as described in other studies. As in other reports, almost all our patients were in Killip and Kimball class I.

Compared with the study by Mauro et al, electrocardiographic abnormalities were more prevalent in our patients (65.4% vs. 46%) and T-wave abnormalities were the most frequent manifestation in both studies (38.3% vs. 25%). (12) However, we encountered higher positive hs-Tn (91.6% vs 65%) though there could be discrepancies in the cut-off point and methodology.

Our center performed a lower number of CA than that reported by Costabel et al. (70% vs. 87%), perhaps due to differences in equipment criteria, but unfortunately, we do not have data on the time to CA performance. Six-month mortality was higher in our case (12.1% vs. 5.7%), which could be due to the great number of comorbidities present in our patients, and that a high percentage, close to 35%, had anterior descending artery involvement.

The need for coronary stent placement (22.4%) was much lower than that presented in the previously cited study (79.6%) and in other national and international registries, where it is close to 100%. We have no record of the type of coronary stent used in our center.

The mean GRACE score of the study by Garmendia et al. was 133.8 ± 52.1 , while that of our data was lower, 112.5 ± 23.8 , maybe justified because the former population had more comorbidities. (13)

Table 1. Baseline population characteristics (n=107)

Variables	Value
Age, years – mean±SD	62.2 ± 10.51
Male gender – n (%)	70 (65.4%)
Smoking – n (%)	49 (45.8%)
Alcohol consumption – n (%)	2 (1.9%)
Comorbidities – n (%)	50 (46.7%)
DM – n (%)	39 (36.4%)
HTN – n (%)	74 (69.2%)
Heart failure – n (%)	8 (7.5%)
CKD – n (%)	10 (9.3%)
Overweight/Obesity – n (%)	30 (28%)
Dyslipidemia – n (%)	34 (31.8%)
COPD – n (%)	2 (1.9%)
AMI – n (%)	38 (35.5%)
PVD – n (%)	2 (1.9%)

SD: Standard deviation. DM: Diabetes Mellitus. HTN: Hypertension. CKD: Chronic kidney disease. COPD: Chronic obstructive pulmonary disease. AMI: Acute myocardial infarction. PVD: Peripheral vascular disease.

Characteristic of the event	Value
Length of hospital stay in days (median and IQR)	3 (2-4)
Typical chest pain, n (%)	77 (72%)
Heart rate – bpm, mean \pm SD	74.7 \pm 15.7
SBP – mmHg \pm SD	140.0 \pm 26.7
Serum creatinine – mg/dl \pm SD	1.2 \pm 0.9
Killip & Kimball I, n (%)	106 (99.1%)
ECG with acute ischemic signs, n (%)	70 (65.4%)
Electrocardiographic abnormality, n (%)	
T-wave abnormality	41 (38.3%)
ST depression	19 (17.8%)
ST depression + T-wave abnormality	6 (5.6%)
Q wave	3 (2.8%)
Echocardiogram with acute ischemic signs, n (%)	35 (32.7%)
Anti-ischemic therapy, n (%)	91 (85%)
Vasodilator therapy, n (%)	38 (35.5%)
Need for CA, n (%)	75 (70.1%)
Positive high-sensitivity troponins, n (%)	98 (91.6%)
Need for coronary stent, n (%)	24 (22.4%)

SD: Standard deviation. SBP: Systolic blood pressure. ECG: Electrocardiogram. CA: Coronary angiography.

Table 2. Characteristics of the NSTE-ACS event

In-hospital GRACE risk category	IHM (%)	Percentage of patients
Low	<1	39.3%
Intermediate	1-3	48.6%
High	>3	12.1%

IHM: In-hospital mortality. Mortality at 6 months after hospital discharge was 12.1%.

Table 3. Stratification of in-hospital mortality risk

CONCLUSIONS

Our registry provides data that do not differ considerably from those of centers with more complex CCU and from studies with a larger number of patients. These data allow to identify that, regardless the center, the most prevalent characteristics of NSTE-ACS patients, as well as the clinical presentation and IHM risk, continue to be similar. The present registry is very useful to complement the database of multi-center studies, as the ones cited here, to have a more real population information.

Conflicts of interest

None declared.

(See authors' conflict of interests forms on the web/Additional material).

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