

Assessment of care quality to patient with acute coronary syndrome in an emergency service**Avaliação da qualidade do atendimento ao paciente com síndrome coronariana aguda no serviço de emergência**

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ABSTRACT

A study aimed to assess quality indicators of the care for patients with suspicion of acute coronary syndrome (ACS) and associate them to discharge, death and, duration of hospitalization. A cross sectional, analytical study of 84 records of patients with ACS suspicion at the emergency service. The association between risk factors and quality indicators of ACS care as: duration of hospitalization, death, recurrence of ischemic events and myocardial revascularization were studied through Spearman's correlations. The duration of hospitalization was significantly smaller for patients with myocardial infarction without ST segment elevation, with a shorter interval between admission and treatment. For patients with myocardial infarction with ST segment elevation, the hospitalization time was significantly shorter when the interval between the risk classification and treatment was shorter. There was no association of quality indicators as recurrence of ischemic events, myocardial revascularization, duration of hospitalization and death.

Descriptors: Myocardial Infarction; Quality of Health Care; Nursing Care.

RESUMO

Estudo com objetivo de avaliar indicadores de qualidade no atendimento aos pacientes com suspeita de síndrome coronariana aguda (SCA) e associá-los a alta, óbito e tempo de internação hospitalar. Pesquisa transversal, analítica de 84 prontuários de pacientes com suspeita de SCA no Serviço de Emergência. Foi estudada a associação entre os fatores de risco e indicadores de qualidade no atendimento à SCA com: tempo de internação, óbito, recorrência de eventos isquêmicos e revascularização do miocárdio por meio da correlação de *Spearman*. O tempo de internação foi significativamente menor para pacientes com infarto sem supradesnivelamento de ST que tiveram menor intervalo entre admissão e tratamento. Para pacientes com infarto com supradesnivelamento de ST, o tempo de internação foi significativamente menor quando o intervalo entre classificação de risco e tratamento foi menor. Não houve associação dos indicadores de qualidade com recorrência de eventos isquêmicos, revascularização do miocárdio, tempo de internação e óbito.

Descritores: Infarto do Miocárdio; Qualidade da Assistência à Saúde; Cuidados de Enfermagem.

INTRODUCTION

Cardiovascular diseases (CDs) constitute the main cause of morbidity and mortality globally and in Brazil⁽¹⁾. The estimate direct cost associated to Acute Coronary Syndrome (ACS) in 2011 under the Unified Health System (SUS) perspective is R\$522.286.726, approximately 0.77% of the total SUS budget. For the Supplementary Health System, this estimate is R\$515.138.617. The indirect costs totalize R\$2.8 billion under the perspective of the Brazilian society. The total cost estimated for ACS in 2011, including direct and indirect costs is R\$3.8 billion⁽²⁾.

The ACS comprehend an operational term defining a range of clinical symptoms compatible with acute myocardial ischemia⁽³⁾. The short interval of time for the beginning of treatment is extremely important, as it is related to better prognosis of patients, once the fast recovery of the blood flow can limit the myocardial lesion, reducing mortality and complications⁽⁴⁾. A study demonstrate that 25 to 33% of delays within the emergency service (ES) and, only 5% in pre-hospital environment⁽⁵⁾.

Regardless of advances in the treatment of patients with ACS, the non-adherence to care protocols and guidelines is still large, directly impacting mortality⁽⁶⁾. The quality indicators (QIs) of assistance have been adopted to assess health services aiming to increase clinical practice efficacy based on available scientific evidence^(5,7). Recent studies demonstrated the QI monitoring and the implementation of care protocols have been improving the assistance quality and decreased the mortality rate by ACS in health establishments⁽⁷⁻⁸⁾.

Nowadays, large emergency services present high demand of care, what can increase the waiting time until medical consultation. In Emergency Services, triage has been recommended aiming to contour the overload of these units, prioritizing care in accordance with severity. Triage in Brazil is denominated Hosting with Assessment and Risk Classification and it is done through protocols, the most used worldwide are: Emergency Severity Index,

Australian Triage Scale, Canadian Triage Acuity Scale and Manchester Triage System⁽⁹⁾.

In Brazil, this activity was regulated to be executed by nurses through the Resolution of the Federal Nursing Council COFEN 423/2012, seen that it is a complex service and has a demand of technical and scientific competence for its execution⁽¹⁰⁾. In this context, the nurse is the professional that does the initial assessment of patients with ACS suspicion, does the first ECG and immediately triggers the medical team to indicate the proper treatment⁽¹¹⁾. Thus, it is evident the importance to know the reality of these services, with the objective to provide efficient care, and to decrease the time of the start of symptoms until the first ECG and the institution for the adequate care of patients with ACS suspicion.

Thus, the objective of this study was to assess the quality indicators of care for patients with suspicion of acute coronary syndrome and to associate them to discharge, death and, duration of hospitalization.

METHODS

A cross-sectional and analytical study, conducted in July to October of 2012, including 84 records of patients with ACS suspicion who received the first care at the ES of a federal university hospital of high complexity, located in São Paulo (SP), Brazil.

The inclusion criteria were records of patients who received the first care at the ES due to ACS suspicion, defined as classic angina, equivalent ischemic or atypical thoracic pain, who conducted the first ECG and the treatment at the service. Patients transferred to other institutions were excluded.

Data collection was after approval of the Ethics in Research Committee from UNIFESP (protocol nº. 32870). Because this study obtained data from records and did not bring risk to patients, the Free and Informed Consent was waived.

Sociodemographic data were collected from a form composed by sociodemographic variables, risk factors for ACS⁽²⁾, quality indicators for ACS care, the score

Thrombolysis In Myocardial Infarction (TIMI), the discharge occurrence or death, and the duration of hospitalization.

The quality indicators collected related to care of patients with ACS suspicion were: time door-ECG; time door-balloon or time door-needle; prescription rate of Acetylsalicylic acid (ASA) during the first 24 hours of hospitalization; rate of ASA prescription until discharge; rate of beta-blocker prescription at discharge; rate of prescription for the angiotensin-converting enzyme (ACE) inhibitor/angiotensin receptor blocker (ARB) at discharge and hospital mortality rate by AMI^(10,12).

The TIMI score is used to predict cardiovascular events in patients with ACS based on clinical history, physical exam, ECG and markers of myocardial necrosis. In patients with acute myocardial infarction with ST elevation (STEMI) can predict the probability of death and adverse events in 30 days, and the score can vary from 0 to 14 (low risk: 0-2; medium risk: 3-5 and high risk : >5)⁽¹³⁾. In patients with unstable angina and non-ST elevation

myocardial infarction (NSTEMI), the death probability, evolution to STEMI and urgency revascularization in 14 days can be predicted, and the score varies from zero to 7 (low risk: 0-2; medium risk: 3-4 and high risk: 5-7)⁽¹⁴⁾.

As in the ES where the study was conducted, the patient admittance is done with risk classification, we opted to include as variable the time of risk classification, conducted by the nurse of these patients.

The Spearman's correlation test was used to establish the association between the quality index (QI) and the outcomes: discharge, death, duration of hospitalization, considering the significance level at 95%.

RESULTS

Table 1 presents the sociodemographic characteristics, clinical presentation, and type of transportation used to search for the ES of the studied population.

Risk factors and heart disease history from the population studied are presented on Table 2.

Table 1: Sociodemographic characteristics, clinical presentation, and type of transportation. São Paulo, SP, Brazil, 2012.

Characteristics	n=84 (%)
Age* (years)	59 (36-89)
Gender	
Male	53 (63.1)
Female	31 (36.9)
Education	
Illiterate	3 (3.6)
Incomplete middle school	29 (34.5)
Complete middle school	10 (11.9)
Incomplete high school	4 (4.8)
Complete high school	24 (28.6)
Incomplete university degree	5 (6.0)
Complete university degree	9 (10.6)
Occupation	
Employee	48 (57.1)
Self-employed	11 (13.1)
Unemployed	1 (1.2)
Retired	20 (23.8)
Stay-at-home	4 (4.8)
Clinical presentation	
Classic angina	72 (85.7)
Angina equivalent	3 (3.6)
Atypical Thoracic pain	9 (10.7)
Type of transportation	
Own ways	67 (79.8)
Ambulance	17 (20.2)

* Median (minimal-maximum value).

Table 2: Risk factors and history of heart disease. São Paulo, SP, Brazil, 2012.

Variables	n=84 (%)
Risk factors	
Sedentary behavior	67 (79.8)
Advanced age	67 (79.8)
Systemic hypertension	57 (67.9)
Smoking	55 (65.5)
Gender	53 (63.1)
Dyslipidemia	36 (42.9)
Heredity	32 (38.1)
Diabetes mellitus	28 (33.3)
Stress	14 (16.7)
Obesity	6 (7.1)
History of heart disease and diagnostic exams	
Acute myocardial infarction	29 (34.5)
Performed catheterization	24 (28.6)
Performed angioplasty	13 (15.5)
Myocardial revascularization	11 (13.1)
Unstable angina	7 (8.3)
Known coronary disease	7 (8.3)
Cardiac insufficiency	3 (3.6)

From the 84 patients admitted at the ES with suspicion of ACS, 30 (35.7%) did not have ischemia diagnosis, 25 (29.8%) were diagnosed with unstable angina, 22 (26.2%) with STEMI and seven (8.35%) with NSTEMI.

The definitive treatment conducted for patients with final STEMI (n=22) and NSTEMI (n=7) diagnosis was percutaneous transluminal coronary angioplasty (PTCA), and in patients with STEMI this procedure was the primary therapy. Among the patients with unstable angina (n=25), eight (32.0%) were treated with PTCA and 17 (68.0%) received conservative treatment.

From all patients with ACS suspicion (n=84), 29 (34.5%) were discharged after ES attention, and 55 (65.5%) stayed hospitalized.

From 25 patients who received unstable angina diagnosis, 18 (72.0%) had intermediate risk, three (12.0%) had high risk and one (4.0%) had low risk for cardiac adverse events. From the patients with intermediate risk, two (11.1%) needed myocardial revascularization (MR) and one (5.5%) evolved to STEMI.

In NSTEMI patients (n=7), four (57.1%) had low risk, two (28.5%) had intermediate risk and one (14.9%) had

high risk for cardiac adverse events, and those needed urgent MR.

Among STEMI patients (n=22), eight (36,4%) had low risk, seven (31.8%) had intermediate risk and six (27.2%) had high risk for cardiac adverse events. One patient (16.6%) from the high-risk group evolved to death during hospitalization.

Regarding quality indicators, the median door-ECG median was 20 min (6-223 min) for all patients (n=84). In patients with unstable angina, the median of door-ECG time was 31 min (7-223 min), in NSTEMI cases it was 32 min (15-134 min) and in patients with STEMI it was 18 min (6-214 min).

For patients submitted to primary PTCA (n=22) the median of door-balloon time was 127.5 min (40-830 min). No patients were submitted to treatment with thrombolytic at the ES.

The ASA prescription rate on the first 24 hours was 100%, and for patients with the ACS diagnosis confirmed (n=53), prescription rates for ASA, beta-adrenergic blockers and ACE/ARB at discharge, was also 100%. The mortality rate by AMI was 1.85%.

There was no association between the QI in care for patients with ACS suspicion and hospital discharge or death occurrence in this population.

For patients with NSTEMI, the time of hospitalization was significantly smaller when the intervals between

patient admission in the ES and conduction of the definitive treatment ($p=0.0085$) and between the risk classification and the conduction of the definitive treatment ($p=0.0085$) were smaller (Table 3).

Table 3: Correlation between hospitalization days and the interval between patient admittance and definitive treatment for patients with non-ST segment elevation acute myocardial infarction (n=7). São Paulo, SP, Brazil, 2012.

Time intervals	Spearman's correlation coefficient	p-value
Patient admission and risk classification	-0.25	0.5957
Patient admission and first electrocardiogram	0.04	0.9389
Patient admission and definitive treatment	0.88	0.0085
Risk classification and first electrocardiogram	0.09	0.8477
Risk classification and definitive treatment	0.88	0.0085

For patients with STEMI, the time of hospitalization was significantly smaller when the interval between the

risk classification and conduction of a definitive treatment was smaller ($p=0.0395$) (Table 4).

Table 4: Correlation between days of hospitalization and risk classification and the definitive treatment for patients with ST segment elevation acute myocardial infarction (n=22). São Paulo, SP, Brazil, 2012.

Time intervals	Spearman's correlation coefficient	p-value
Patient admission and risk classification	-0.06	0.7785
Patient admission and first electrocardiogram	0.15	0.5043
Patient admission and definitive treatment	0.40	0.0664
Risk classification and first electrocardiogram	0.18	0.4102
Risk classification and definitive treatment	0.44	0.0395

DISCUSSION

Cardiovascular Diseases (CDs) are the main cause of death worldwide⁽¹²⁾. Developed and developing countries present CDs as the main proportional cause of death, but 80% of the world impact of the disease comes from developing countries, as Brazil⁽¹⁵⁾. In these societies, CDs represents a threat to social and economic development, overall due to the high proportion of premature deaths⁽¹²⁾.

The sample of this study was predominantly composed by male patients (63.0%), with median age of 59.9 years and their main risk factors for ACS occurrence was sedentary behavior, and advanced age, both identified in 79.8% of patients. A study conducted in an ES in Porto Alegre, in 2007 and 2008, which objective was to identify ACS risk factors, also found that most individuals (63.8%) were male, with mean age of 61 years and 86.8% had sedentary behavior as risk factor⁽¹⁶⁾. Besides, the

occurrence of previous AMI was the most found antecedent of cardiac disease in this study (34.5%), a result similar to what was found in a study conducted in Santa Catarina during 2005 and 2007, with the intention to describe the profile of ACS patients. In 26,6% there was a previous AMI history and 21.2% of cases had previous angina⁽¹³⁾.

Regarding education, there was a predominance of incomplete middle school (34.5%). A case control study conducted in Portugal in 2011, with the objective to identify ACS risk factors, demonstrated that low education has a relationship with the exposure of risk factors for coronary disease that can be explained by the lack of knowledge in prevention actions of the disease⁽¹⁴⁾.

From the total patients included in this study, 85.7% presented classic angina as the most common clinical presentation, and 64.3% received ACS diagnosis being the unstable angina the most prevalent diagnosis (29.8%),

followed by STAMI (26.2%) and NSTAMI (8.3%). A partially similar result was found in a multi-center study idealized and managed by the Brazilian Cardiology Society aimed to report the final results of the first 30 days of evolution of patients included in a Brazilian registry dedicated to ACS, in which patients were diagnosed with unstable angina (31.6%), STEMI (33.4%) and NSTEMI (34.9%)⁽¹⁷⁾.

Regarding the definitive treatment, patients with STEMI (26.2%) were treated with primary PTCA. The American Heart Association (AHA) recommends the PTCA as treatment of choice for these patients in hospitals with available hemodynamics services, considering that this therapy has been demonstrated major benefits in relation to survival as well as for the occurrence of clinical complications, when compared to therapy with fibrinolytic⁽⁵⁾. For patients with the NSTEMI diagnosis (8.3%) and for 9.5% of individuals with unstable angina, the treatment of choice also is PTCA. The AHA recommends that for patients with increase of cardiac necrosis markers or, unstable angina with unstable clinical conditions or of high risk, to be treated with PTCA as soon as possible⁽⁵⁾.

In this study, the TIMI risk score was used to identify the probability of death and adverse events in patients with confirmed ACS diagnosis⁽¹⁸⁾. The intermediate risk for cardiac adverse events was identified in 72.0% of patients with unstable angina, and 11.1% needed emergency MRI, and 5.5% evolved to STEMI. In patients with intermediate risk of unstable angina, in accordance with the TIMI risk score, the probability of cardiac adverse events varied from 18.2 to 19.9%⁽¹⁸⁾. From patients with STEMI, 27.2% were classified as high risk for adverse events. From those, one 16.6% evolved to death in 30 days. The probability to occur cardiac adverse events, in accordance with the TIMI risk score for patients with NSTEMI varies from 16.1 to 35.9% for the high-risk group⁽¹⁴⁾.

Regarding the QI on ACS care, the median of door-ECG time was 20 minutes, and for only 25% of patients the time was equal or smaller than 10 minutes, a

preconized time by the AHA⁽⁵⁾. It was also observed that the median of door-ECG time was of 18 minutes. In patients with STEMI, the value was smaller than when compared to unstable angina and NSTEMI patients. Different results were found in another study conducted at the private Advanced Unit of Urgency in São Paulo, where it was assessed through care indicators, the quality of care for patients with STEMI that verified the average time for door-ECG of seven minutes, and 80% of cases with time faster than 10 minutes⁽¹⁹⁾. Even after the implementation of the Hosting with Assessment and Risk Classification (HARC), where the objective is to prioritize care for more severe patients in the ES, the door-ECG time stayed higher than preconized, which can be attributed to infrastructure issues and overcrowding of Emergency Services in our country. This contributes with the increase of waiting time for attention and the first ECG⁽²⁰⁾. The median of door-balloon time in this study was 127.5 minutes, and in 45.5% of cases, the PTCA was performed until 90 minutes. The door-balloon time up to 90 minutes is the recommended QI by the AHA in patients with STEMI⁽⁵⁾.

The prescription rates of ASA during the first 20 hours and ASA, adrenergic beta-blockers and ACE/ARB at discharge was of 100% in this study, according to what is preconized by AHA guidelines, that indicates these medications to all patients with ACS diagnosis, with the intention to decrease mortality and the occurrence of recurrent ischemic events after reperfusion therapy⁽²¹⁾.

It was not possible to establish a statistical significant association between the QI and the occurrence of discharge, early death, and clinical complications in this study, due to the low frequency of the studied variables.

The hospitalization duration was significantly smaller ($p=0.0085$) for patients with NSTEMI patients who had a smaller time interval between admission at the ES and the definitive treatment, that reinforces the need of early reperfusion therapy for these patients⁽²¹⁾. When the hospitalization time is assessed for patients with STEMI, it was observed that it was significantly smaller ($p=0.0395$)

when the interval time between the assessment of the risk classification by the nursing team and the conduction of the definitive treatment was smaller, demonstrating the importance of the HARC in prioritizing attention to patients with ACS suspicion. The time is fundamental to obtain better results for ACS patients. Thus, the nurse does the HARC, being the first professional to have contact with these patients at the ES, and the nurse should prioritize care based on institutional protocols and preconized guidelines⁽¹¹⁾. The ES of the Hospital São Paulo is responsible for about 1.000 patients per day and, as in other services, with different levels of severity, and it has in common the same entrance door. The nurse performs the HARC through an institutional protocol, in which it is preconized that patients with ACS suspicion should be referred to the emergency room for medical assessment and immediate ECG should be done.

CONCLUSION

The first hours of an acute myocardial infarction with ST- segment are of great importance for the individual's prognostic. In this context, the diagnosis and the therapeutic should be conducted early. These factors justify the relevance of adequate preparation of the nurse for the hosting activity with risk classification at Emergency Services and knowledge of the algorithms of

care for patients with thoracic pain at the emergency room.

One of the limiting factors of this study was the data collection of non-digital records of a University Hospital, which can probably reduce the quality of information. The conduction in a unique center that can turn difficult the generalizability of results to other populations and regions of the country, but they demonstrate the importance to monitor QIs for better care for patients with ACS suspicion.

The medians for door-ECG and door-balloon times were of 20 minutes and 127.5 minutes, respectively. The prescription rates for ASA during the first 24 hours, ASA, adrenergic beta-blockers and ACE/ARB at hospital discharge was 100%. The mortality rate by AMI was 1.85%. There was no association between QI for ACS and discharge, occurrence of clinical complications and early death.

The hospitalization time was significantly smaller for patients with NSTEMI when the interval between the admission at the ES and the definitive treatment was smaller. For patients with STEMI, the time of hospitalization was significantly smaller when the interval between the risk classification and the conduction of definitive treatment was smaller.

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