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ORIGINAL ARTICLE

PREHOSPITAL CARE CHARACTERISTICS OF PATIENTS WITH SUSPECTED OR DIAGNOSED CORONARY SYNDROME

CARACTERÍSTICAS DO ATENDIMENTO PRÉ-HOSPITALAR DE PACIENTES COM SUSPEITA OU DIAGNÓSTICO DE SÍNDROME CORONARIANA

CARACTERÍSTICAS DE LA ATENCIÓN PREHOSPITALARIA DE LOS PACIENTES CON SOSPECHA O DIAGNÓSTICO DE SÍNDROME CORONARIO

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ABSTRACT

Objective: to characterize the prehospital care of patients with clinical suspicion or diagnosis of acute coronary syndrome. ***Method:*** retrospective, cross-sectional study, with quantitative approach, performed at a mobile care service. For analysis, the collected data were subjected to statistical analysis using the SPSS for Windows version 16.0. ***Results:*** 144 (2.39%) records represent all cases related to acute coronary syndrome, 28 patients attended for clinical reasons and 116, for patient transportation with clinical suspicion or diagnosis of acute coronary syndrome. The primary outcome was the referral to the cardiology duty, represented by 74 cases. ***Conclusion:*** there is need to implement new strategies to obtain better results in the treatment of acute myocardial infarction in this service, such as the request of the electrocardiogram by the nurse after assessing when arriving at the service. ***Descriptors*:** Acute Coronary Syndrome; Health Services Needs and Demand; Ambulances; Emergency Nursing.

RESUMO

Objetivo: caracterizar o atendimento pré-hospitalar de pacientes com suspeita clínica ou diagnóstico de síndrome coronariana aguda. ***Método***: estudo retrospectivo, transversal, com abordagem quantitativa, realizado em um serviço móvel de atendimento. Para análise, as informações coletadas foram submetidas à análise estatística com auxílio do Programa SPSS *for Windows* versão 16.0. ***Resultados***: os 144 (2,39%) prontuários representam todos os casos relacionados à síndrome coronariana aguda, 28 atendimentos por motivo clínico e 116 para transporte de paciente com suspeita clínica ou diagnóstica de síndrome coronariana aguda. O principal desfecho foi o encaminhamento para o plantão cardiológico, representado por 74 casos. ***Conclusão*:** novas estratégias necessitam ser implantadas para que melhores resultados no tratamento do infarto agudo do miocárdio possam ser obtidos neste serviço, como a solicitação do eletrocardiograma pelo enfermeiro após a avaliação na chegada ao serviço. ***Descritores*:** Síndrome Coronariana Aguda; Necessidades e Demandas de Serviços de Saúde; Ambulâncias; Enfermagem em Emergência.

RESUMEN

Objetivo: caracterizar la atención pre-hospitalaria de los pacientes con sospecha clínica o diagnóstico de síndrome coronario agudo. ***Método:*** estudio retrospectivo, transversal, con abordaje cuantitativo, realizado en un servicio de atención móvil. Para el análisis, los datos recogidos fueron sometidos a análisis estadístico con el programa SPSS versión 16.0 para Windows. ***Resultados:*** 144 (2.39%) representan los registros de todos los casos relacionados con el síndrome coronario agudo, 28 por razones clínicas y 116 para el transporte de pacientes con sospecha clínica o diagnóstico del síndrome coronario agudo. El resultado primario fue la referencia a la cardiología, representado por 74 casos. ***Conclusión:*** nuevas estrategias deben ser aplicadas para mejores resultados en el tratamiento del infarto agudo de miocardio en este servicio, como la solicitud del electrocardiograma por la enfermera después de la evaluación en la llegada al servicio. ***Descriptores*:** Síndrome Coronario Agudo; Necesidades y Demandas de Servicios de Salud; Ambulancias; Enfermería de Urgencia.

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INTRODUCTION

The Acute Coronary Syndrome (ACS) comprises a range of clinical symptoms compatible with acute myocardial ischemia.[1] In the rooms of emergency care, ACS is responsible for almost 1/5 of chest pain cases, and cardiovascular diseases account for approximately 32% of deaths in the general population, representing the first cause of mortality in Brazil.[2]

Since 1960, there has been an increasing interest in prehospital care related to acute myocardial infarction (AMI) justified by the high rate of deaths that occurred before the arrival of patients to the hospital. In recent decades, the mortality rate from cardiovascular disease has significantly reduced, mainly due to the advances in primary prevention and evolution of therapy for ACS, occurring more evidently in developed countries, due to the fast access and appropriate treatment options, such as reperfusion by primary angioplasty or fibrinolysis, dual antithrombotic therapy and intensive care.[3-4]

Cardiovascular diseases also constitute the leading cause of mortality worldwide. It is expected that, by 2020, these diseases will be the cause of approximately 25 million deaths, 19 million of them in low- and middle-income countries.[5] The high mortality rate in the Brazilian public health system relates, mainly, to the difficulties of treatment in intensive care, reperfusion methods and therapeutic measures established for the AMI.[6]

Therefore, among the health services specialized in assistance to patients suffering from clinical diseases that require rapid and skilled intervention, there is the mobile prehospital. This service covers the assistance provided outside the hospital, with the purpose of promoting population demands.[7]

Considering the expressiveness of ACS, its prevalence and the importance of immediate care, prehospital services are considerably important. Part of the responsibility of the service teams in the first contact with the patient infers considering the provision of progressively qualified assistance. The nursing work in this context is essential in providing care to patients in both basic support units (BSU), by the performance of nursing assistant/technicians, as in advanced support units (ASU), by the nurse's work, who is also responsible for the management of nursing care.[7]

Thus, the objectives of this study are:

- To characterize the prehospital care of patients with clinical suspicion or diagnosis of acute coronary syndrome.
- To verify technologies and resources used in the prehospital during the visits, and identify the outcome of the consultations.

METHOD

Retrospective, cross-sectional study, with quantitative approach, consisting of all the records of patients with clinical suspicion[8] or diagnosis of ACS, attended by a private mobile prehospital service in southern Brazil, from January 1st to December 31st, 2011. According to the records, of 4,763 attendances, 144 were patients with clinical suspicion or diagnosis of ACS. Therefore, the study sample consisted of 144 records, selected by convenience. The patients' medical records were included with clinical suspicion or diagnosis of ACS, both genders and aged 18 years or more, attended by the private mobile prehospital service. There was no need to delete records by mistake or incomplete filling.

This study was submitted to the Research Ethics Committee of the Feevale University/RS and approved under protocol number 4.04.03.11.2182. Data were collected in October and December, 2012, in a place provided by the mobile care service, using an instrument developed by the researchers. Next, the data were tabulated in a spreadsheet for database.

For analysis, the collected information were subjected to statistical analysis using SPSS for Windows version 16.0. The results of nominal variables were expressed through frequency analysis and the results of the continuous variables, as mean ± standard deviation. In order to verify the correlation between the variables 'displacement time' and 'age' with the variables related to vital signs, the Pearson correlation analysis was used. For verifying the association between the call reason, outcome and severity with the other study variables, the One Way ANOVA or Student t test was used according to test assumptions. For verifying the normality of the data, the Kolmogorov-Smirnov test was used. It was considered significant a $p<0.05$.

RESULTS

There was analysis of 144 records (all care provided for clinical suspicion of ACS), representing 2.39% of the total number of patients (care provided for all conditions or demands) by the mobile service during one year. Of the sample, 54.86% of the records were male patients. The average age of

patients was 62.86 ± 16.24. Weekdays with the highest demand for care were, in decreasing order, Thursday, 18.06% (n=26); Tuesday, with 17.36% (n=25) and Friday, with 15.97% (n=23). In the afternoon shift, there were 34.72% (n=50) of the visits and the lowest percentage occurred in the dawn shift, with 13.19% (n=19).

Regarding distribution of services by month (Figure 1), the months of April and December had the lowest occurrences of service, with 2.08% and 4.17%, respectively. The highest incidences were in March and May, with the same percentage of 11.81% (17 patients); and the month of August, with 11.11% (16 records).

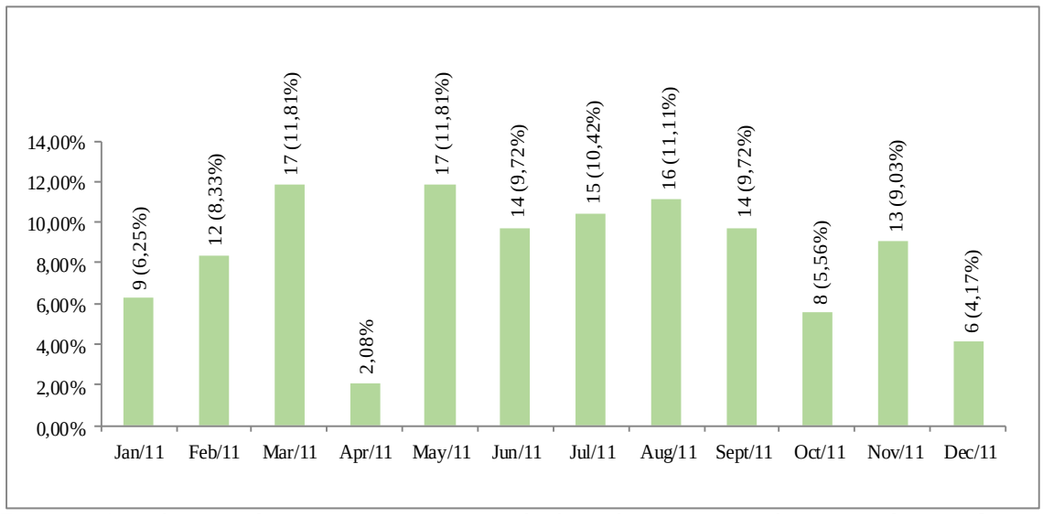

Figure 1. Distribution of services to patients with clinical suspicion or diagnosis of Acute Coronary Syndrome by month.

The months of the highest incidence of care during the studied period are March and May, but the most prevalent period are the months from May to September, which, in the surveyed area, are months that correspond to the autumn and winter, with lower temperatures (southern Brazil).

Table 1. Characteristics of care to patients with clinical suspicion or diagnosis of acute coronary syndrome. Novo Hamburgo, Rio Grande do Sul, Brazil, 2013.

Variables	n = 144
Reason	
Chest pain	27 (18.75%)
Cardiopulmonary arrest	1 (0.69%)
Removal/Transportation	116 (80.56%)
Care site	
Residence	22 (15.20%)
Workplace	3 (2.08%)
Business establishment	1 (0.69%)
Amusement establishment	1 (0.69%)
Thoroughfare	1 (0.69%)
Removal/Transportation Source	
Emergency Room	94 (65.28%)
Clinic	3 (2.08%)
Hospital	19 (13.19%)
Time elapsed in minutes and ± standard deviation of the drive PHC service until the arrival for the removal/transportation	16.36 ± 16
Diagnosis	
Acute Coronary Syndrome	23 (15.97%)
AMI	63 (43.75%)
Angina	10 (6.94%)
Precordial pain	20 (14.58%)

It can be seen that 116 patients were attended for transportation (80.56%) with a response time of 16.36 ± 16 minutes and the main transportation source was the Emergency Department, with 65.28% of the calls. The site with the highest number of visits was the patient's residence.

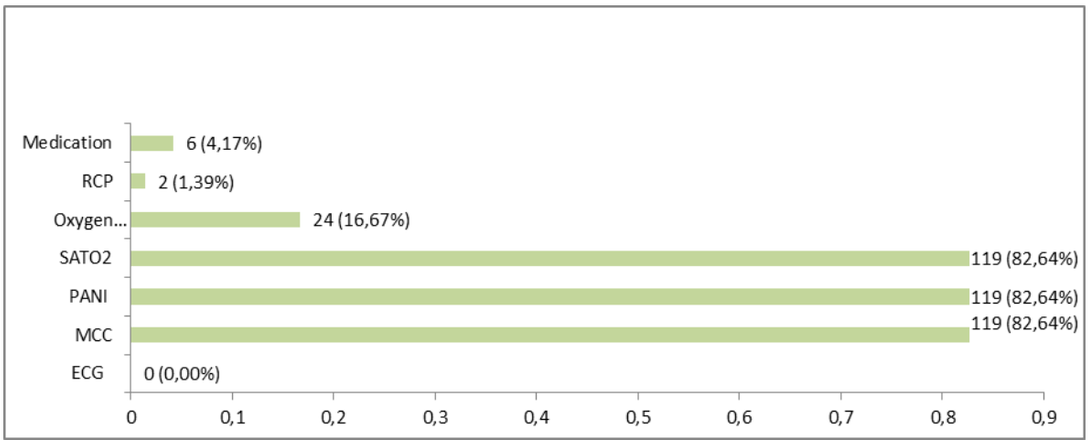

Figure 2. Resources used to care for patients with clinical suspicion or diagnosis of Acute Coronary Syndrome.

Continuous Cardiac Monitoring (CCM), oxygen saturation (O2Sa) and measurement of Noninvasive Blood Pressure (NIBP) were the most commonly used procedures.

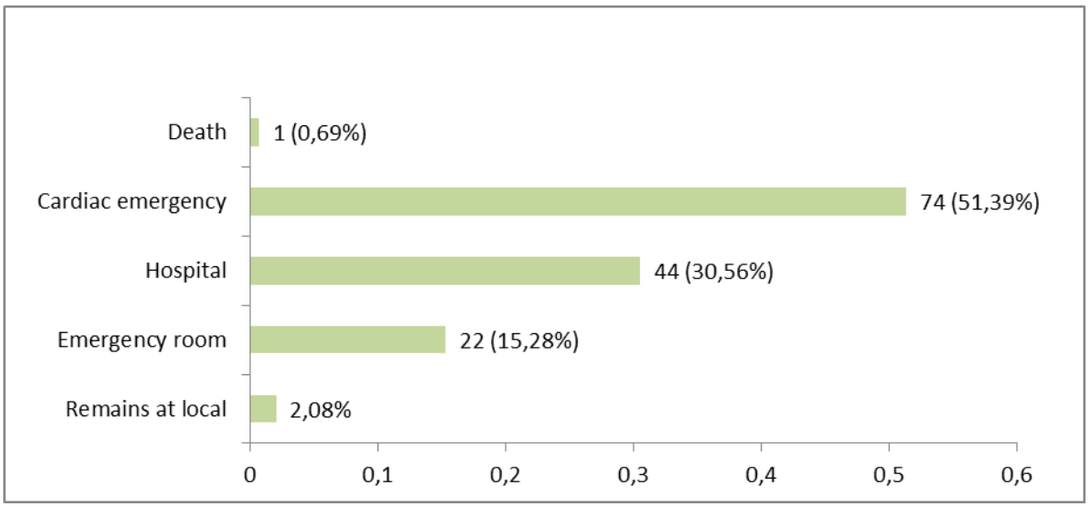

Figure 3. Outcome of patients attended with clinical suspicion or diagnosis of Acute Coronary Syndrome.

Regarding the outcome (Figure 3), the most common was the referral of patients to cardiac duty, that is, hospital with cardiac emergency and hemodynamic service available 24 hours/day.

Table 2. Association between the call reason and the other study variables of patients treated with clinical suspicion or diagnosis of Acute Coronary Syndrome. Novo Hamburgo, Rio Grande do Sul, Brazil, 2013.

	Call Reason		
	Clinical n = 28	Transportation n = 116	P
Gender			
Male	9 (32.14%)	70 (60.34%)	0.07
Female	19 (67.86%)	46 (36.66%)	
Age	64 ± 20	52.17 ± 15	0.6
Elapsed time from the service drive to arrival at patient	13.82 ± 8.8	16.90 ± 17	0.36
Weekday			0.99
Sunday	4 (14.29%)	16 (13.79%)	
Monday	5 (17.86%)	17 (14.66%)	
Tuesday	5 (17.86%)	20 (17.24%)	
Wednesday	4 (14.29%)	14 (12.07%)	
Thursday	5 (17.86%)	21 (18.10%)	
Friday	4 (14.29%)	19 (16.38%)	
Saturday	1 (3.57%)	9 (7.76%)	
Shift			0.06
Dawn	8 (28.57%)	11 (9.48%)	
Morning	5 (17.86%)	29 (25%)	
Afternoon	8 (28.57%)	42 (36.21%)	
Evening	7 (25%)	34 (29.31%)	
Type of support			0.01
Basic	25 (89.29%)	36 (31.03%)	
Advanced	3 (10.71%)	80 (68.97%)	
Outcome			0.01
Remains in place	3 (10.71%)	0 (0%)	
Emergency room	20 (71.43%)	2 (1.72%)	
Hospital	0 (0%)	44 (37.93%)	
Cardiac emergency	5 (17.86%)	69 (59.48%)	
Death	0 (0%)	1 (0.86%)	

The group of patients treated for clinical reason consisted of 28 individuals, mostly female, 19, (67.86%), with a mean age of 64 ± 20, and a response time of 13.82 ± 8.8. The weekdays with the highest incidence of calls were Monday, Tuesday and Thursday, with n=5 (17.86%) on each day. The morning and afternoon shifts were the most frequent, representing n=8 (28.57%), in each. Of these patients, 89.29% were attended by the Basic Life Support team and the outcome with the highest rate was referral to the Emergency Room, representing n=20 (71.43%).

Regarding transportation, 116 records showed the predominance of male patients, 70, (60.34%) with a mean age of 52.17 ± 15 and a response time of 16,90 ± 17, and the days with the highest flow were Tuesday and Thursday, represented by n=20 (17.24%) and n=21 (18.10%), respectively. The afternoon shift had the highest attendance rate, representing n=42 (36.21%), the advanced support was used in n=80 (68.97%), and the primary outcome was the referral to cardiac emergency, with n=69 (59.48%).

The data also show that the Basic Life Support (89.29%) was more used in calls than the Advanced Life Support (10.71%).

Table 3. Association between the outcomes of the remaining variables of patients treated with clinical suspicion or diagnosis of ACS. Novo Hamburgo, Rio Grande do Sul, Brazil, 2013.

	OUTCOME					P
Variables	Remains in place n =3	Emergency Room n = 22	Hospital n = 44	Cardiac Emergency n = 74	Death n = 1	
GENDER						
Male	1 (33.33%)	7 (31.82%)	25 (56.82%)	45 (60.81%)	1 (100%)	0.12
Female	2 (66.67%)	15 (68.18%)	19 (43.18%)	29 (39.19%)	0 (0%)	
Age	36.33 ± 7.5	67.5 ± 14.27	61.20 ± 15.57	63.36 ± 15.57	79	0.01
Response Time	10.66 ± 5.77	13.31 ± 8.79	21.68 ± 23.50	14.47 ± 12.77	7	0.13
Weekday						0.13
Sunday	0 (0%)	4 (18.18%0	3 (6.82%)	13 (17.57%)	0 (0%)	
Monday	0 (0%)	6 (27.27%)	9 (20.45%0	6 (8.11%)	1 (100%)	
Tuesday	1 (33.33%)	3 (13.64%)	11 (25%)	10 (13.51%)	0 (0%)	
Wednesday	1 (33.33%)	2 (9.09%)	8 (18.185)	7 (9.46%)	0 (0%)	
Thursday	0 (0%)	4 (18.18%)	8 (18.185)	14 (18.92%)	0 (0%)	
Friday	0 (0%)	2 (9.09%)	5 (11.36%)	16 (21.62%)	0 (0%)	
Saturday	1 (33.33%)	1 (4.55%0	0 (0%)	8 (10.81%)	0 (0%)	
SHIFT						0.45
Dawn	0 (0%)	5 (22.73%)	2 (4.55%)	12 (16.22%)	0 (0%)	
Morning	1 (33.33%)	4 (18.18%)	9 (20.45%)	20 (27.03%)	0 (0%)	
Afternoon	1 (33.33%)	5 (22.73%)	21 (47.73%)	22 (29.73%)	1 (100%)	
Evening	1 (33.33%)	8 (36.365)	12 (27.27%0	20 (27.03%)	0 (0%)	

In relation to the outcome of patients and other variables, patients who remained in the service location were mostly female, with n=2 (66.67%), with an average age of 36.33 ± 7.5 years, with a response time of 10.66 ± 5.77 minutes, the most frequent weekdays were Tuesday, Wednesday and Saturday, and the morning, afternoon and evening shifts were the most common.

Patients, according to the outcome, had the referral to emergency care n=22, were female n=15 (68.18%), mean age 67.5 ± 14.27, resource response time of 13.31 ± 8.79, with prevalence of Monday, represented by n=6 (27.27%) and night shift, with n=8 (36.36%).

Conversely, patients who had as outcome the referral to hospital were predominantly male, n=25 (56.82%); mean age 61.20 ± 15.57; response time of 21.68 ± 23.50; predominance of Tuesday, with n=11 (25%); with the highest incidence in the afternoon shift, representing 21% of the total.

The outcome with the highest rate was the referral to cardiac emergency, with n=74; prevalence of male, n=45 (60.81%); mean age 63.36 ± 15.57; response time of 14.47 ± 12.77; Friday as the day of the week with the highest rate, with 21.62%; and prevalence of the afternoon shift, with 29.73%.

DISCUSSION

The data in this research are in line with a study[9] that pointed to the prevalence of patients affected by ACS, male and older than 60, showing the importance of professionals involved with the care with this age group, considered a risk class for sudden cardiovascular events.

Patients with risk factors for coronary heart disease are more likely to infarction or clinically suspected ACS. The risk factors are: age>50 years (men) and 55 years (women), smoking, family history of previous coronary heart disease (father and brothers with a history of coronary heart disease before 50 years old and mother and sisters before 55 years), hypertension, diabetes, dyslipidemia and obesity.[9]

Study shows that the cold weather influences the triggering of respiratory and cardiovascular diseases, such as asthma, bronchitis, sinusitis, cerebrovascular accident, angina and cardiac arrhythmias.[10]

The relationship between cold weather and cardiovascular disease has hypertension as the major cause. The incidence of large daily temperature range also corresponds to a higher incidence of mortality from cardiovascular diseases.[11] Physiologically, heart frequency decreases, breathing becomes slower and the blood vessels constrict, increasing blood pressure[12]

Study[13] showed that hypertension correlates with climatic factors, and hypertensive crises occur more frequently in cold and rainy days, especially on days when there are large temperature variations. This same study also showed that low relative humidity values of the air reflected in the exacerbation of the number of cases of hypertension.

The transportation or removal of patients in mobile prehospital care bases on routing design of patients to places where they have condition to receive the necessary care to ensure their lives. Another possibility is the transportation of patients for examinations or transfers between hospitals, safely, providing, during the course, the needed care.[14]

The need to reduce displacement time favors an agile service to the population. One must take into account traffic conditions, as they impact the response time and influence on the time of arrival of the prehospital care team to the scene.[15]

The typical pain of coronary heart disease is described as a sudden feeling of heaviness or tightness in the chest area, most often radiated to the left upper arm, and less frequently to the jaw or epigastric region. When this pain progresses to heart attack, it is longer than 30 minutes. Other symptoms may be associated, such as nausea, vomiting, feeling of imminent death, sweating or sympathetic discharge. Physical examination little help in the diagnosis, because it is often unchanged. The ECG is the most important examination in prehospital care.[16-17]

With respect to the reason, the AMI occurs in about 10% to 20% of cases of chest pain. However, there is evidence that up to 10% of patients with chest pain are discharged from the emergency services with AMI.[18]

The basis for the diagnosis of heart attack and ACS classification is found in the electrocardiogram (ECG), as it allows initially classifying the patient with clinical suspicion of ACS.[19] In analyzed medical records, there was no records on performing ECG, which may be justified by the high number of patients transported by the mobile service, coming from Emergency Unit, with a possible previous electrocardiogram.

The ECG, when performed in the service place and interpreted by the physician in the ambulance, demonstrated to be a method that reduces by 34% the needle-frame time and 18% the balloon-frame time, as well as provides higher rates of ideal balloon-frame time (less than 90 minutes).[20]

In this study, 16.67% of patients used oxygen (n=24). It is not necessary to provide supplemental oxygen to patients without evidence of respiratory distress, if the oxy-hemoglobin saturation is ≥94%.[1]

The AMI patient needs to receive treatment in hospital, in ICU or other specific units, on, average, the first three days, being monitored continuously, so that any complications, especially arrhythmias, are immediately identified and treated.[20]

According to the legislation, which provides for the regulation of Nursing Care in Prehospital Care and other situations related to the Basic and Advanced Life Support, it is up to nurses to perform highly complex procedures and provide nursing care in land, air or water ICU mobile units.[21] This can justify the highest rate of Advanced Life Support in transportation of these patients.

Regarding the association between the call reason and the other study variables of patients treated with clinical suspicion or diagnosis of ACS (Table 02), one can observe a statistically significant difference between the type of support and the call reason. In clinical services, there was a higher percentage of visits by the Basic Life Support and, in the transportation care, there was an increased use of Advanced Life Support (p=0.01). There was no significant association between the type of care and the patients' gender, age or elapsed time from the activation of the PHC service to the arrival of the patient and day care.

Regarding the association between the outcome and the remaining variables of patients treated with clinical suspicion or diagnosis of ACS (Table 03), the patient who died was male and had higher age than the other patients. There was no statistically significant association between the outcome and gender, response time, shift, day care.

In Brazil, in 2009, there were 76,481 deaths associated with ACS, regardless of place of death. ACS, in Brazil, accounted for 7% of all deaths to the health system in 2009, where, in the same year, cardiovascular disease accounted for 29% of total deaths, reaching the highest cost of hospitalizations at 1.9 billion and 19% of hospitalizations costs.[22-23]

The resource allocation and other actions of the planning of health actions can be guided by the identification of calls peaks according to weekdays. There are usually decreased calls on weekends, but this analysis should be continuous, because many factors can alter this profile.[24]

CONCLUSION

Cardiovascular diseases has emerged as the leading cause of morbidity and mortality for decades, including, in this group, ACS, representing a challenge for the prehospital care teams for they are the first professionals that meet these patients. Data from this study reinforce those found in the literature: patients affected by ACS have an average age of 60 years. As for the patients treated in the household and that remained at the site of care, according to discard of the possibility of emergency care including a cardiovascular event, they have an average age of 36.33, quite below the average of the patients affected by ACS.

In this study, 144 (2.39%) of 4763 records were analyzed regarding all of the care

provided by a private mobile prehospital care service in 2012. Regarding the characterization of cases, objective of this research, the 144 analyzed records represent all ACS-related cases attended in 2012, of these, 28 related to care for clinical reasons and 116, for transportation with clinical suspicion or diagnosis of ACS. Twenty-seven individuals sought the service for chest pain and 94 transportations came from the emergency room, where the main diagnosis was AMI. The primary outcome was the referral to the cardiology duty, represented by 74 cases.

In this context, the development and use of service quality indicators can benefit from the excellence in service aiming at measurement of such indices, as well as constant monitoring for promoting better strategies of care, due to the large demand of patients with chest pain who seek emergency services.

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