

## PATIENTS WITH ACUTE MYOCARDIAL INFARCTION AND INTERFERING FACTORS WHEN SEEKING EMERGENCY CARE: IMPLICATIONS FOR HEALTH EDUCATION

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*With the objective of estimating the time elapsed between the beginning of the signs and symptoms of a heart attack until the arrival at the cardiology emergency service (Delta T) and the factors that influence in this process, 112 patients were studied, with an infarction diagnosis with supraelevating ST segment. The delta T was on average of 3h59±2h55min; 99(88%) of those patients sought out an emergency service within 1h after the beginning of the event. Unmarried patients presented a delta T smaller in relation to the others (P=0,006), as well as those that recognized the symptoms as a heart event; thoracic pain with burning symptoms, were described by 25 (24%) of patients, and the first attitude taken, in view those symptoms, was self-medication 37(33%). The recognition of the signs and symptoms of Acute Myocardium Infarction, is a decisive factor for the seeking of a specialized service.*

**DESCRIPTORS:** myocardial infarction; signs and symptoms; time; nursing

## PACIENTES CON INFARTO DEL MIOCÁRDIO AGUDO Y LOS FACTORES QUE INTERFIEREN EN LA BÚSQUEDA DE UN SERVICIO DE EMERGENCIA: IMPLICACIONES PARA LA EDUCACIÓN EN SALUD

*Con el objetivo de estimar el tiempo transcurrido entre el inicio de las señales y síntomas del infarto hasta la llegada al sector de emergencia cardiológica (delta T) y los factores que influenciaron ese proceso, se estudiaron 112 pacientes, con diagnóstico de infarto con elevación del segmento ST. El delta T fue en promedio de 3h59min±2h55min, siendo que 99(88%) de esos pacientes buscaron un servicio de emergencia una hora después el inicio del evento. Pacientes solteros presentaron un delta T menor en relación a los demás (P=0,006), así como aquellos que reconocieron los síntomas como un evento cardíaco; dolor torácico con ardor fue relatado por 25(24%) pacientes, siendo que la primera actitud tomada ante esos síntomas fue la automedicación 37(33%). Se concluyó que el reconocimiento de las señales y de los síntomas de IMA por el paciente es un factor determinante en la búsqueda de atención especializada.*

**DESCRIPTORES:** infarto del miocárdio; signos y síntomas; tiempo; enfermería

## PACIENTES COM INFARTO AGUDO DO MIOCÁRDIO E OS FATORES QUE INTERFEREM NA PROCURA POR SERVIÇO DE EMERGÊNCIA: IMPLICAÇÕES PARA A EDUCAÇÃO EM SAÚDE

*Com o objetivo de estimar o tempo decorrido entre o início dos sinais e sintomas do infarto até a chegada ao setor de emergência cardiológica (delta T) e os fatores que influenciaram esse processo, estudou-se 112 pacientes, com o diagnóstico de infarto com supradesnível do segmento ST. O delta T foi, em média, de 3h59min±2h55min, sendo que 99(88%) desses pacientes procuraram por serviço de emergência uma hora após o início do evento. Pacientes solteiros apresentaram delta T menor em relação aos demais (p=0,006), assim, como aqueles que reconheceram os sintomas como evento cardíaco; dor torácica em ardência foi relatada por 25(24%) pacientes, sendo que a primeira atitude tomada diante desses sintomas foi a automedicação 37(33%). Concluiu-se que o reconhecimento dos sinais e dos sintomas de infarto agudo do miocárdio (IAM) pelo paciente é fator determinante para a procura por atendimento especializado.*

**DESCRIPTORES:** infarto do miocárdio; sinais e sintomas; tempo; enfermagem

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## INTRODUCTION

Despite coronary care units, improved fibrinolytic therapy and new percutaneous coronary intervention procedures, acute myocardial infarction (AMI) has been the main cause of death because of its high incidence and prehospital mortality<sup>(1)</sup>. According to electrocardiographic criteria, there are two different kinds of AMI with therapeutic differences<sup>(2)</sup>, which are AMI with strongly uneven ST segments and AMI without strongly uneven ST segments. Therapy for AMI patients without strongly uneven ST is similar to therapy for unstable angina. AMI Patients with strongly uneven ST are treated with thrombolytics and percutaneous transluminal coronary angioplasty (PTCA), with or without stent<sup>(1)</sup>. Treatment for AMI with strongly uneven ST is mainly related to the length of the reperfusion therapy. Arterial recanalization applied at the right time entails several benefits for ventricular function maintenance and for a longer life<sup>(3)</sup>. People must be aware of the signs and symptoms of the patients and look for emergency service in order to decrease morbimortality<sup>(1)</sup>.

According to several studies, only 20% of acute thoracic pain patients arrive at the emergency room within two hours after the start of the symptoms<sup>(3-4)</sup>, because they may not know that it is a heart condition; it happens because of their low socioeconomic level, because they are female or because of self medication<sup>(5)</sup>. One study states that patients in Brazil do not seek healthcare services promptly because they do not recognize AMI symptoms, because they do not accept what they are feeling, because first aid is not specialized and because of bad public transportation<sup>(6)</sup>. Identifying the reasons why patients delay the search for health services is important because, based on these data, nursing professionals can interfere and educate patients, their relatives and the community. Thus, the goal of this study is to measure the time patients take to arrive at cardiac emergency service providers (delta T) from the beginning of the AMI symptoms, and what influences this procedure.

## METHODS

This cross-sectional study was carried out at a specialized hospital in the state of Rio Grande do Sul, Brazil, from March/2006 to August/2006. It

involved conscious, oriented AMI patients with strongly uneven ST evidenced by electrocardiogram (ECG), who were older than 18 and sought emergency service (ES). The clinical conditions and enzymatic changes were registered in the patients' health records. AMI Patients with strong ST who also had hemodynamic instability, coming from admission units, presenting cardiogenic shock and patients from cities in the interior of the state were excluded.

The patients answered a questionnaire about clinical, socio-demographic and first symptoms data, considering location, characteristics, irradiation, pain intensity, associated symptoms, first reaction towards the pain and reasons for seeking specialized emergency service. The intensity of the pain was measured using a numeric scale varying from 0-10; 0 represents no pain at all and 10 represents the worst pain. The researcher applied the questionnaire during the first 24 hours of hospital admission. The outcome was delta T, that is, the amount of time between the beginning of the symptoms and the arrival at the Emergency Service. Comorbidities and the time of arrival at the ES were registered on the first visit report. The Research Ethics Committee of the Institution approved this project, and its goals were explained and clarified in the patients' term of consent. Statistical analysis was performed using SPSS statistical software. Continuous variables were presented as averages and standard deviation or median and interquartile percentiles according to purposes of normality; categorical variables were presented in absolute and relative frequencies. Fisher's exact test and Pearson's chi-square test were used to compare categorical variables; Student's t, Mann-Whitney and Kruskal-Wallis were used to compare continuous variables. A boxplot graph was created between delta T and the patients' perception of a cardiac event. All analyses used  $\alpha=5\%$  significance level ( $P < 0.05$ ).

## RESULTS

There were 112 patients participating in the study; 80 (71.4%) were men and their average age was  $58 \pm 12$  years. Sixty-two (55.4%) patients were workers; 90 (80.4%) came from the city of Porto Alegre and 71 (63.4%) were married (Table 1). Delta T, the amount of time patients take to get to cardiologic emergency service since the beginning of the

symptoms, was 3hr59min ± 2hr55min, on the average; 98 (88.39%) patients sought medical services one hour after the beginning of the symptoms. The variables age ( $r_s = 0.12$ ), income ( $r_s = 0.17$ ) and education ( $r_s = 0.24$ ) had a weak to moderate correlation with delta T, respectively. Table 2 shows that married, divorced and widowed patients presented higher delta T than single patients. Patients with AMI or previous myocardial revascularization did not present different delta T when compared to the other patients.

Table 1 – Demographic and clinical characteristics (n = 112)

Characteristics	N%
Age (in years) *	58 ± 12.1
Male	58 ± 12.1
Married	58 ± 12.1
Minimum wage†	3.0(2.0-5.0)
Years of education †	8.0(5.0-11.0)
Worker	62(55.4)
Therapy used	
Coronary angioplasty	96(85.7)
Thrombolysis	6(5.4)
Diabetes Mellitus	21(18.8)
High blood pressure	72(64.3)
Tobacco	47(42.0)
Hyperlipidemia	26(23.2)
Previous infarct	26(23.2)
Ischemic heart disease background	31(27.7)
Previous revascularization	11(9.8)
Cardiac failure	5(4.5)

\* datum presented in average and standard deviation

† data presented with median and 25 and 75 percentiles

Table 2 - Demographic and clinical characteristics and delta T (n = 112)

Characteristics	N %	Delta T (hr:min)	P
Civil status			
Married	71(63.4)	4:13 ± 3:02	0.006
Single	9(8.0)	1:28 ± 0:55	
Divorced	23(20.5)	3:47 ± 3:09	
Widowed	9(8.0)	4:16 ± 1:36	
Place of origin			
Porto Alegre	90(80.4)	3:38 ± 2:59	0.004
Metropolitan area	22(19.6)	5:00 ± 2:29	
Means of transportation*			
Car	67(59.8)	2:56 ± 2:22	0.000
Ambulance	43(38.4)	5:31 ± 3:06	
Previous AIM			
Yes	23(20.5)	3:20 ± 2:24	0.292
No	89(79.5)	4:03 ± 3:03	
Previous Myocardial Revascularization			
Yes	11(9.8)	3:47 ± 3:07	0.879
No	101(90.2)	3:55 ± 2:56	

Delta T is presented in average ± sd.

\* Two patients from the sample are not in this chart because they took the bus.

Eighty-nine patients (84%) had burning retrosternal pain followed by pressing retrosternal pain. In 82 (73.2%) patients, this pain irradiated to other parts of the body, such as the upper limbs [24 (29.3%)]. The patients also presented other symptoms like sudoresis [35 patients (38.8%)], nausea and vomiting [24 patients (26.6%)], but only 22 (19.6%) patients felt only that kind of pain. Sixty-three (56.3%) patients were doing some activity when they first felt the AIM symptoms. The patients gave different reasons for not seeking a specialized emergency service promptly; thirty-seven (33%) patients stated that their first reaction was self-medication when they started feeling pain; 34 (30.4%) patients expected that the thoracic discomfort and symptoms would disappear without the use of medication and 15 (13.3%) patients asked relatives, friends and/or neighbors for help. Only 36 (32.1%) patients decided to go to a specialized service by themselves, because they noticed that they were feeling symptoms of a heart condition; 26 patients (23.2%) went to the emergency service when their retrosternal pain worsened, and 21 patients (18.8%) sought the emergency service when their medication, for example sublingual nitrate, did not relieve their pain (Table 3).

Table 3 - Delta T according to circumstantial and subjective variables mentioned by the patients (n = 112)

Variables	N %	Delta T(hr:min)	P
Intensity of the pain (0-10)			
8 - 10 (intense)	92 (82.1)	3:47 ± 2:52	0.361
●7 (mild to moderate)	20 (17.8)	4:27 ± 3:15	
First reaction to the pain			
Self-medication	37 (33.0)	3:36 ± 2:24	
Expecting that the symptoms would disappear	34 (30.4)	4:29 ± 3:29	
Asking help from relatives/friends or ambulance service	15 (13.3)	3:21 ± 2:01	0.193
Seeking a healthcare center or non-specialized service	9 (8.0)	4:35 ± 2:53	
Others	17 (15.2)	3:35 ± 3:32	
Reasons to turn to a specialized service			
Noticing that the symptoms are related to a cardiac condition	36 (32.1)	3:16 ± 2:32	
Increased pain	26 (23.2)	3:54 ± 2:32	
Self-medication did not relieve the pain	21 (18.8)	4:39 ± 3:20	0.083
Insistence of a relative or friend	16 (14.3)	4:51 ± 4:08	
Transference from a general hospital	13 (11.6)	3:20 ± 1:56	

Delta T presented on the average ± sd.

Patients whose pain irradiated to other parts of the body reported stronger pain ( $8.6 \pm 1.8$ ) than patients whose pain did not. ( $7.8 \pm 2.3$ ) ( $P = 0.03$ ). Patients who had not considered thoracic pain as a heart condition presented lower delta T ( $3\text{hr}16\text{min} \pm 2\text{hr}32\text{min}$ ) than patients who had ( $4\text{hr}13\text{min} \pm 3\text{hr}04\text{min}$ ) ( $P = 0.041$ ).

## DISCUSSION

It is known that the significance of coronary arterial recanalization in the development of AMI with strongly uneven ST segments depends on the patients' perception of the symptoms and how fast they seek emergency services. However, evidence shows that there are different reasons for them to delay going to emergency services<sup>(7-9)</sup>.

In this study, average delta T was 3hr11min, the same as in a previous study, whose goal was to compare how long it took from the beginning of the symptoms until hospital admission in four countries. Average delta T in the U.S.A. was 3hr50min; in South Korea, 4hr40min; in Japan, 4hr50min and in England, 2hr50min<sup>(10)</sup>. In another study in Northern Ireland, average delta T was 2hr15min<sup>(7)</sup>. All delta T values found are different from recommendations by the American Heart Association<sup>(11)</sup>. In this study, education, gender and age were not determining in the analysis of the time patients took to seek for a cardiac service. However, literature shows that women and elderly people take more time to go to an emergency service<sup>(6,8,12)</sup>. This study also showed a longer average time for patients who used ambulance services in relation to the others, and this fact contradicts other studies which state that the average time from the beginning of the pain to the moment they get to the emergency service decreases when using ambulance services<sup>(9-10)</sup>. The request for ambulance services and the patient's assistance depends on some factors, such as: availability of ambulance services and distance to the healthcare service. Besides, the ambulance can transfer the patient to the nearest health service, which may not be specialized and lack the resources to help AMI patients. Using previous medication during thoracic pain crisis, which increases delta T, is another determining factor for not rushing to an emergency service. A great part of the sample had an AMI background, and the patients were used to self-medication. A study with 403 Swedish patients showed that 70% of them with angina background used nitrate

to relieve pain before going to the doctor<sup>(9)</sup>. According to both studies and to our professional experience with cardiac patients, they are often told to use nitrate for thoracic discomfort. Those guidelines can influence the patient to make a decision about going to an emergency service, because even some relief can make patients relate their problem to more serious conditions.

It is also important to mention that the patients can delay a trip to a specialized service because they tend to go to healthcare clinics or healthcare units beforehand, and those kinds of services are not prepared to diagnose and treat AMI properly; thus, the patient has to be transferred to larger healthcare centers and this influences delta T<sup>(12)</sup>. It could be concluded that the amount of ambulances available for transportation, training courses for groups who deliver pre-hospital care in cases like as acute myocardial ischemia, lack of berths in emergency or intensive therapy centers belonging to the single health system in regional hospitals influence the delta T of patients from the metropolitan area, with higher delta T results than patients living in the state capital. Recognizing the signs and symptoms of cardiac conditions was determining to seek emergency services, and, consequently, to have lower delta T. Previous studies confirm that patients who can recognize AMI symptoms go to emergency services as soon as they notice them, and thus present lower delta T<sup>(13-14)</sup>. This study shows that, if delta T is compared to an AMI background, it decreases. So, it can be concluded that patients who can recognize cardiac symptoms early better understand the disease because of a previous experience.

Patient and family education is the main strategy to promote health. Considering that the patient usually has family support, relatives must also be educated about health. In a modern health education perspective, the educator is the facilitator of the subjects' findings and reflections about reality, and the individuals have the power and autonomy to choose the possibilities<sup>(15)</sup>. At those moments, the professionals can identify what is missing, what was not understood and the gap between what was said or written and what is understood and how it is understood, in terms of knowledge about health and health habits; fantasies, taboos, difficulties in being a patient or a patient's relative and in being sick<sup>(16)</sup>. The nurse is one of the main mediators of the teaching-learning process, aiming at health promotion, focusing on understanding the signs and symptoms of eminent cardiovascular conditions and the value of going to specialized services immediately<sup>(17)</sup>.

## CONCLUSIONS

In spite of potential benefits of early care delivery to AMI patients, few patients are treated within the first 60 to 90 minutes after the beginning of the signs and symptoms. In this study, the average delta T was 3hr59min  $\pm$  2hr55min, and most of the sample sought medical help one hour after the onset of the symptoms. Marital status, patient origins, means of transportation and education influenced the delay in seeking for emergency services, and consequently increased delta T. The data presented confirmed the need for local and national preventive measures, as well as information campaigns to educate people about the risks and clinical symptoms of AMI.

Preventing new situations and making people aware of the decrease of modifiable risk factors should be emphasized. Healthcare professionals who work with education should broaden their praxis to give some information in order to stimulate people's and the community's senses, that is, the perception of the individual, establishing relationships and offering solutions for common problems<sup>(18)</sup>. Health education predicts community awareness, arousing individual capacities in relation to their real health needs<sup>(15)</sup>. This study shows that some patients were transferred from other institutions, especially in the metropolitan area. They had an increased delta T since transference often depends on acceptance and available berths at other institutions.

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