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ELETROCARDIOGRAM GATE TIME IN PATIENTS WITH THORACIC PAIN IN THE **EMERGENCY**

TEMPO PORTA ELETROCARDIOGRAMA EM PACIENTES COM DOR TORÁCICA NA **EMERGÊNCIA**

TIEMPO PUERTA-ELECTROCARDIOGRAMA EN PACIENTES CON DOLOR TORÁCICO EN LA **EMERGENCIA**

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ABSTRACT

Objective: to identify electrocardiogram gate time in patients with chest pain in the emergency room. Method: integrative review, using PVO technique, carried out in February 2017, in the VHL Portal and Medline, Web of Science, ScieLO and CIHNAL sites, using the descriptors Chest Pain, Electrocardiography, Emergencies, identified in the MeSH, in the title CINAHL, coinciding with the DeCS, using the Boolean operator AND in all associations. Results: according to the search strategies, ten articles with origin in developed countries and only one Brazilian were identified. Conclusion: the literature defines that the electrocardiogram for patients with chest pain in the emergency room should be done within ten minutes. There is a need to develop further studies on the performance of the ECG in prehospital care in order to carry out conducts directed to cardiac disorders. Descritores: Angina Pectoris; Emergencies; Electrocardiography; Nursing Care; Emergency Nursing; ST Elevation Myocardial Infarction.

Objetivo: identificar o tempo porta eletrocardiograma em pacientes com dor torácica na emergência. Método: revisão integrativa, utilizando técnica PVO, realizada em fevereiro de 2017, no Portal da BVS e nos sites Medline, Web of Science, ScieLo e CIHNAL, com o uso dos descritores dor no peito, eletrocardiografia, emergências, identificados no MeSH, no título CINAHL, coincidindo com os DeCS, utilizando o operador booleano AND em todas as associações. Resultados: segundo as estratégias de busca, identificaram-se dez artigos de origem em países desenvolvidos e somente um brasileiro. Conclusão: a literatura define que a realização do eletrocardiograma para pacientes com dor torácica na emergência deve ser feita em até dez minutos. Há a necessidade de se desenvolverem mais estudos sobre a realização do ECG no atendimento préhospitalar para se tomarem condutas direcionadas diante a agravos cardiológicos. Descritores: Angina Pectoris; Emergências; Eletrocardiografia; Cuidados de Enfermagem; Enfermagem em Emergência; Infarto do Miocárdio com Supradesnível do Segmento ST.

Objetivo: identificar el tiempo puerta-electrocardiograma en pacientes con dolor torácico en la emergencia. Método: revisión integrativa, utilizando técnica PVO, realizada en febrero de 2017 en los servicios, en el Portal de la BVS, y en los sitios, Medline, Web of Science, ScieLo y CIHNAL, con el uso de los descriptores dolor en el pecho, electrocardiografía, emergencias, identificados en el MeSH, en el título CINAHL, coincidiendo con los DeCS, utilizando el operador booleano AND en todas las asociaciones. Resultados: según las estrategias de búsqueda, se identificaron diez artículos, los cuales son de origen en países desarrollados y sólo uno es brasileño. Conclusión: la literatura define que la realización del electrocardiograma para pacientes con dolor torácico en la emergencia debe ser hecha en hasta 10 minutos. Hay la necesidad de desarrollar más estudios sobre la realización del ECG en la atención prehospitalaria para tomar conductas dirigidas ante agravios cardiológicos. Descritores: Angina de Pecho; Urgencias Médicas; Electrocardiografía; Atención en Enfermería; Enfermería de Urgencia; Infarto del Miocardio con Elevación del ST.

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INTRODUCTION

Cardiovascular diseases are the main cause of in-hospital mortality and complications in Brazil. Between 2001 and 2010, more than one million deaths from diseases of the circulatory system were recorded, with deaths due to acute myocardial infarction (AMI) representing 40.5% of the total, with 603,932 deaths. Although apparently high, this rate is significantly lower when compared to that observed in the 1970s, when approximately 30% of patients with AMI died, while currently only 6-7% are headed for this outcome.¹

Chest pain is the predominant symptom of Acute Coronary Syndrome (ACS), which presents itself initially in 75-85% of patients. The way chest pain presents itself has been identified as a greater predictive power for acute coronary disease, since, even though the criteria for diagnosis of ACS are well established, the characteristics of thoracic pain do not always resemble those described classically, some classified as atypical and still those clinical pictures of which chest pain is not a part.²

The differentiation of thoracic pain from acute coronary syndromes is complex. When the patient complaining of chest pain is admitted to the emergency room, health professionals are required to have an accurate diagnosis and a quick conduct. Given this, it is necessary to know how to differentiate chest pain from cardiac cause to noncardiac causes to direct the medical conduct to be followed.³

Chest pain usually presents itself in severe intensity, oppression, weight or burning, with irradiation to the arms (usually the left one), preceded by unusual effort and decreased with rest. However, research shows that 40% of patients diagnosed with AMI may present non-characteristic chest pain such as epigastralgia, indigestion, chest discomfort and pain in the dorsal region. ⁴

The approach of the patient under suspicion of AMI in an out-of-hospital setting should be made by a health professional, with a directed anamnesis, characterizing the current symptoms (timing of onset, duration, quality, intensity, relation with effort and resting) and presence of established coronary disease (prior angina). Some characteristics are known to be determinant for the atypical manifestation of a coronary event, and should be remembered when an individual is approached in the prehospital phase, for masking the AMI condition. ⁵

In the intra-hospital environment, in the emergency department, the initial steps to differentiate the origin of chest pain are: the

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adequate and rapid anamnesis; the specific and directed clinical examination and the verification of the vital signs. The electrocardiogram (ECG) and the serum markers of myocardial injury (troponin I and CK-MB) are helpful in diagnosing as well as describing the causes of chest pain. The ECG is the fastest technique to diagnose AMI, and should be performed when the patient arrives in the emergency services, as it can confirm the diagnosis of AMI in 20-60% of cases. ³

According to the V Guideline of the Brazilian Society of Cardiology, the ECG performed quickly at the place of care and interpreted by a qualified physician has been shown to be a method that decreases needle gate time by 34% and balloon gate time by 18% (<90 minutes or 82.3%, when the prehospital ECG was performed, vs. 70% when the ECG was not performed, p <0.0001), and having a tendency to reduce in-hospital mortality in patients with acute myocardial infarction with supra sclerosis (ASTSEMI). ⁵

According to the literature, the significant variation in ECG-holder time and needle-hold time is 22 to 80 and 140 to 270 minutes, respectively. A study conducted in England in 2002 reported needle-gate time between five and 300 minutes, reducing to five to 70 minutes after introducing measures to optimize care with nurses' interventions in the recognition of infarction and the onset of thrombolysis. ⁶

Based on this assumption, it is of great importance to perform the ECG in the patient with chest pain complaint rapidly so that the prognosis of patients with acute ST-segment elevation myocardial infarction (ASTSEMI) is more favorable and that the heart muscle is preserved and approached quickly. Upon completion of the ECG, its determines the progress of emergency care generating the following question: How long ECG is performed for patients with chest pain admitted to the emergency room?

OBJECTIVE

 To identify the ECG gate time in a patients with chest pain in the emergency room.

METHOD

An integrative literature review was used as a research method that has the following steps: problem formulation; establishment of inclusion criteria and exclusion of studies for search in the literature; data analysis; categorization; evaluation of the studies included in the integrative review,

interpretation of the results and presentation of the review. ⁷

The research strategy used, in the guiding question, was the PVO technique, which allows to organize the elements of structural form grouped as follows: P refers to the problem situation, participant or context; V is related to the study variables; O refers to the outcome or expected outcome. In view of this, the following question was built: What is the electrocardiogram gate time in patients with chest pain in the emergency room? The following structure is considered: P - chest pain; V emergencies "emergencies"; O - electrocardiography "electrocardiography".

For this integrative review of the literature, we used descriptors identified in the Medical Subject Headings (MeSH) and the CINAHL (Cumulative Index to Nursing and Allied Health Literature), found from EBSCO's host CINAHL with Full Text, coinciding with the Descriptors in Health Sciences of the Virtual Health Library (VHL) and using the Boolean operator AND in all associations.

The publication of the publications was published in February 2017 in the VHL Portal, PUBMED (Medical Literature Analysis and Retrieval System Online), Web of Science, Scientific Electronic Library Online (SciELO) and CINAHL. Inclusion criteria used were: original articles in full in the free mode; published in the last five years; with English, Spanish and Portuguese. As for the exclusion criteria, it was those articles that did not meet the object of study, as they also did not meet the inclusion criteria.

Data collection was performed in February 2017, by the participant researcher, using a

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password on the CAPES portal so that they could have access to a greater diversity of articles. The adopted PVO strategy used the MeSH and Title CINAHL descriptors, according to the databases and with all methodological rigor required by integrative review surveys.

In the data collection, when applying the descriptors using the AND operator, 210 articles were identified in the VHL. After using the inclusion criteria, there were 20 articles, and after the reading and analysis conference. seven articles remained. In Medline, 117 articles were identified. Using the inclusion criteria, four articles remained and, after analyzed, an article remained. In relation to the Web of Science, initially, 210 articles were selected. After applying the inclusion criteria, eight articles remained and, after analysis, only one article. The Cinahl database presented 16 articles and, application of the inclusion criteria, two remained articles that were analyzed totalizing an article.

After carrying out the search strategies in each bank and database, ten scientific articles were found: seven in the VHL (BIREME); one on Medline Via Pubmed; an article in the Web of Science and one in CINAHL. However, in Scielo, no articles were found that addressed the theme and strategy.

From this quantitative, the evaluation by duplicate and the reading of the titles and abstracts of the selected studies were carried out totalizing the ten articles that fit the questioning of the research. For the evaluation of eligibility, a complete reading of the ten articles that integrated this research was done (Figure 1).

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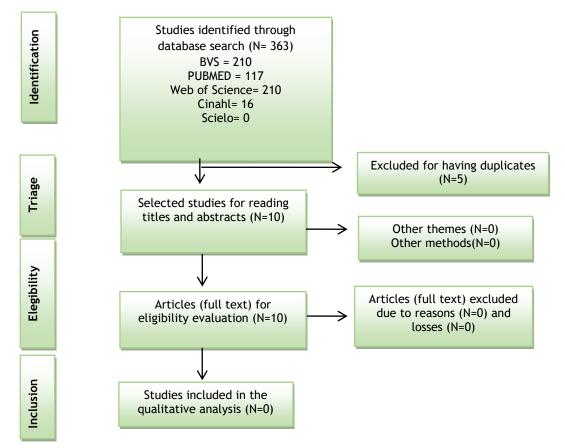


Figure 1. Flowchart of identification, selection and inclusion of the articles, for the development of the research. Brazil, 2017.

RESULTS

For an understanding of the bibliographic survey, the total number of articles selected

is presented according to the following characteristics: title, periodical, country / year, objectives, design and results (Table 1).

Title	Journal	Country / Year	Objectives	Results
Diagnostic accuracy of ST- segment elevation myocardial infarction by various healthcare providers	International Journal of Cardiology	England / 2012	To compare the accuracy of the ECG interpretation for the diagnosis of NSTEMI by different groups of health professionals involved in the STEMI program at the institution studied.	Cardiologists were more likely to provide correct interpretation compared to other groups. False-positive diagnoses were probably made by paramedics when compared to cardiologists. There was a positive correlation between increased ECG exposure and accurate diagnosis of STEMI.
ECG signs of acute myocardial ischemia in the prehospital setting of a suspected acute coronary syndrome and its association with outcomes	American Journal of Emergency Medicine	Sweden / 2014	(ECG) of acute myocardial ischemia in patients with suspected acute coronary syndrome and (b) describe the relationship between the various ECG patterns and the diagnosis of acute myocardial infarction (AMI).	Among 1546 patients, 312 (20%) had ECG signs of acute myocardial ischemia. Of these, 57% had a definitive diagnosis of AMI versus 26% of those with other abnormal ECGs and 12% of those with an ECG without significant pathological findings. Although ECG signs of acute myocardial ischemia predicted heart failure and ventricular tachyarrhythmias before and after hospital admission, there was no significant difference, in 30-day mortality, among the three groups of patients.
Pre-Hospital Electrocardiogr aphy by Emergency Medical Personnel	Journal of the American College of Cardiology	USA/ 2012	This study aimed to measure the impact of prehospital electrocardiogram at hospital scene time for patients with chest pain of cardiac origin and those with ST-segment elevation myocardial	There were 21,742 patients evaluated for chest pain during the study period. The implementation of pre-hospital ECG resulted in minimal increases in mean-time and transport time. However, in comparison with patients with chest pain, in patients with STEMI, the shortest median time of the scene, the transport time and the time of scene for the hospital were

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Prehospital Nitroglycerin Safety in Inferior ST Elevation Myocardial Infarction	Prehospital Emergency Care	Canada/ 2015	infarction. Over a period of 29 months, 1,466 cases of STEMI were identified. Hypotension occurred after nitroglycerin in 38/466 STEMI s lower and 30/339 non-inferior STEMI s. An drop in systolic blood pressure ≥ 30 mmHg post nitroglycerin occurred in 23.4% of the lower STEMI and 23.9% of the non-inferior STEMIs.	observed. Patients with lower thoracic pain and STEMI in computer-readable electrocardiogram, is not associated with with a higher rate of hypotension than patients with STEMI in other territories. Computational interpretation of Lower STEMI can not be used as the sole predictor for patients who may be at increased risk of hypotension after Nitroglycerin.
The 12-lead ECG in the emergency medical service setting: how electrode placement and paramedic gender are experienced by women	Prehospital care	New Zealand / 2014	The objective of this study was to explore the attitudes of women regarding the precordial electrode placement and the acquisition of 12-lead ECG in the emergency medical servisse.	Twenty-six participants (52%) preferred to place the electrodes in the breast; 19 (38%) were indifferent between the two stages and five (10%) preferred the positioning under the breast. 94% of participants reported consenting to a pre-hospital ECG, regardless of the gender of the paramedical team, and all reported that they would have the investigation, if it facilitated definitive treatment, even if the paramedic was male.
Use of Prehospital 12-Lead Electrocardiogr aphy and Treatment Times Among ST-Elevation Myocardial Infarction Patients With Atypical Symptoms	Academic emergency medicine	USA/ 2014	The objective was to determine the association of atypical presentations in the prehospital context about the probability of receiving a prehospital ECG and subsequent time for reperfusion therapy.	(87.1%) patients with chest pain
Use of Chest Pain Protocol in Emergency Care Hospital Reference in Cardiology	Brazilian Journal of Cardiology	Brazil/ 2013	To verify the evolution of the patients who entered the PA of the reference hospital in cardiology, in São Paulo, with complaint of chest pain, through the use of protocol.	Of the patients treated, 43.0% were diagnosed with cardiac causes and, of these, 73.0% of them suffered from ischemic disease. The majority were male (60.0%) aged 41-70 years. They were hospitalized mainly in the intensive care unit and the main course adopted was catheterization with angioplasty.
Air Versus Oxygen in ST- Segment- Elevation Myocardial Infarction	Circulation	Australi a/ 2015	To assess the use of oxygen, since it is commonly administered to patients with ST elevation myocardial infarction, although previous studies suggest a possible increase in myocardial injury as a result of coronary vasoconstriction and increased oxidative stress.	The mean peak troponin was similar in the oxygen and non-oxygen groups. There was a significant increase in mean peak creatine kinase in the oxygen group compared to the non-oxygen group. There was an increase in the rate of recurrent myocardial infarction in the oxygen group compared to the non-oxygen group and an increase in the frequency of cardiac arrhythmia. At six months, the oxygen group showed an increase in the size of the myocardial infarction in cardiac magnetic resonance.
ST segment elevations: Always a	Indian heart journal	Italy/ 2013	The objective of our review is to give an overview of the main	The guidelines recommend that patients with symptoms suggestive of myocardial ischemia and ST elevations

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marker of acute myocardial infarction?		conditions that can mimic an ST segment Myocardial Infarction.	in more than two contiguous leads should receive immediate reperfusion therapy. In addition, new strategies (such as pre-hospital electrocardiographic wireless transmission) aiming to reduce the time of balloon port depend on the accurate interpretation of the ECG by trained readers.
Variation in the Use of 12-Lead Electrocardiogr aphy for Patients With Chest Pain by Emergency Medical Services in North Carolina	the American 2013 Heart	The aim of the study was to identify patients, geographic, EMS-related agency factors, associated with the inability to perform a prehospital ECG across the state's geography.	from 22.9% to 74.2% and was lower in rural areas. Men were more likely than women to have an ECG performed. The certification level of the EMS vendor and the availability of ECG equipment at the system level were

Figure 2. Characterization of selected articles according to title, period, country, year of publication objectives, study design and results. Teresina, Piauí, Brazil, 2017.

After the analysis, it was observed that almost all (nine of the ten articles evaluated) originated in developed countries and only one is Brazilian. What can be inferred is that there is a need for more national research in cardiology, as well as that reference institutions in cardiology have headquarters in the developed countries that produced the most articles: the USA, with three articles, and other countries with only one article (England, Sweden, Italy, Australia, New Zealand, Canada and Brazil).

It is also observed that there is an incentive in the research of the ECG in the prehospital perspective by the teams of paramedics, which is not observed in the place where this study was done, where there is only ECG at the hospital level.

DISCUSSION

Coronary heart disease remains one of the leading causes of mortality in the world, where a range of pharmacological options, advances in intervention techniques and improved care systems have led to significantly improved outcomes for patients with acute myocardial infarction. Timely administration of a thrombolytic agent or infarct-related artery angioplasty significantly improves outcomes for patients with a ST-elevation myocardial infarction (STEMI).⁷⁻⁸

In addition, sophisticated pre-hospital emergency medical care systems have evolved to optimize the transport of patients suspected of myocardial infarction to not only the nearest, but, also, appropriately equipped, treatment facilities. Previous studies have highlighted the important role played by paramedics in the prehospital

identification of STEMI, with early identification, leading to a shorter time to gate-to-drug, balloon time and mortality. 8

In a study conducted in São Paulo, Brazil, 48.25% of the patients had cardiac causes when they came to the emergency department with complaints of chest pain. The mean age of the patients treated was 58.2 ± 15.9 years, and 60.0% of the patients were male. There is an increasing number of patients seeking emergency services with symptoms of chest pain. 3.8%

Acute chest pain is one of the most common symptoms among patients who, not traumatized, request the emergency medical service and receive the highest emergency priority. Early identification prehospital setting of patients suffering from an acute coronary syndrome will shorten the delay for delivery of effective treatment and thus improve the likelihood of a successful outcome. However, there has been an increase in the number of patients in contact with mobile emergency services for acute chest pain over the last decades resulting in a decrease in the proportion of AMI, and the pattern found in this population ECG therefore needs to be assessed. 9

In order to have these evaluations, the assessment protocols for patients with chest pain are based on the analysis of the characteristics of the pain and the initial electrocardiogram. These data allow to establish the probability of the patient being a patient with acute coronary syndrome. The ECG time (hospital time to ECG) should be a maximum of ten minutes. This time was fulfilled for the patients who were screened using the bases of the Manchester triage with yellow and orange colors. For patients who

were screened with green color, the ECG time was longer than ten minutes on average, because for these, the chest pain protocol is only opened by the doctor at the time of the consultation that can reach up to the maximum, 120 minutes.⁹

addition ECG, diagnostic to the confirmation requires the use of some complementary tests, such as measurement of serum markers of myocardial injury (CK-MB and troponins), which are essential in determining the presence of myocardial infarction acute and stratification risk of these patients. 3.8

ECG is the simplest way to diagnose AMI, and should be performed on arrival at the patient's care, as it confirms the diagnosis of AMI in 20-60% of cases. Most AMI deaths occur outside the hospital environment, with 40-65% of deaths occurring within the first hours of illness and, approximately, 80% in the first 24 hours.^{3,9}

The ECG is the easiest and most available method to confirm or exclude the diagnosis of AMI and to decide on the appropriate treatment strategy. Early manifestations of myocardial ischemia typically are of interest to T-wave and ST-segment. It is possible to perform the STEMI diagnosis when, in a given clinical context, a new ST-segment elevation is detected in at least two continuous leads. In an ECG recorded at a paper speed of 25 mm / s and an amplification of 10 mm / mV, ST segment elevation from the baseline shall be measured 80 ms after point J and shall be considered present if the deviation is 0.2 mV in men and 0.15 mV in women, in V2 and V3 connections. Despite the high sensitivity, the ST-segment deviation has, however, poor specificity, since it can present many other conditions (such as left bundle branch block, cardiomyopathy hypertrophy, ventricular aneurysm). 10

More than half of the patients with ECG signs of acute myocardial ischemia met the criteria for a confirmed MI. For patients with ST elevation, this value was even higher. This emphasizes the value of a standard 12-lead ECG in the prehospital setting. However, almost a third of patients with these ECG signs did not have a final diagnosis of AMI or angina pectoris. This finding highlights the challenging difficulty involved in predicting AMI, together with the need for further improvements in prehospital diagnosis among AMI patients and a clinical suspicion of ACS. 9-

It is complex the differentiation of chest pain from acute coronary syndromes, which offer risk of death, chest pain from other Eletrocardiogram gate time in patients...

causes. The fact that the patient with a complaint of thoracic pain to enter the service of prompt care requires, of the professionals of the health área, a precise diagnosis and a quick conduct. In this way, it is important to differentiate chest pain from cardiac cause to noncardiac to direct the medical conduct to be followed. ^{3.10}

In this study, patients with ECG signs of acute myocardial ischemia were at a higher risk of heart failure prior to hospital admission than those with normal ECGs. In after hospital addition, admission. hypotension and the supraventricular arrhythmias were more frequent in patients with ECG signs of acute myocardial ischemia the other ECG than in two groups. **Arrhythmias** and systolic myocardial dysfunction are known as the main causes of cardiac death in patients suffering from an AMI. These findings highlight the well-known association between acute myocardial ischemia and electrical and mechanical instability in the initial phase of AMI. There is a known relationship between the extent of myocardial damage and the risk of with complications. **Patients** signs of myocardial ischemia with ECG are expected develop further damage myocardium. 9-10

In an American study, more than 60% of patients with STEMI arrive at the hospital for emergency medical services (EMS), therefore a critical component of STEMI treatment involves immediate diagnosis through a 12-lead electrocardiogram on-site or ambulance before arriving at the hospital. For patients with STEMI, the use of a prehospital ECG by EMS has been shown to dramatically reduce the time to reperfusion therapy because it allows, paramedics, to provide advanced notification to receive emergency departments cardiac and catheterization laboratories. 11

The ACP / AHA recommends the rapid onset treatment of percutaneous coronary intervention (PCI), and the interpretation of ECGs passed into the hands of frontline health workers. Many ambulances are now equipped with the ability to conduct off-hospital ECGs before arriving at an emergency department (DE). Paramedics can activate the coronary catheterization laboratory (CCL) and thus trigger the personal CCL provision for the hospital. It is well documented paramotor-activated CCL programs lead to reduced balloon port times (DTBT), and a greater number of procedures are performed within the recommended 90 min guideline regardless of the day or time of activation.¹²

The decision of first responders to obtain a pre-hospital ECG in a given patient is largely driven by the protocols. Current US protocols recommend that paramedics obtain ECGs in all patients over 30 years of age who have chest pain or those with suspected acute myocardial infarction. However, a practical limitation to this approach is that a significant proportion of patients with STEMI do not present typical symptoms of chest pain. Studies indicate that up to 20% of patients, especially women and the elderly, may not present with chest pain and have symptoms such as atypical dyspnoea, weakness or nausea. In the hospital setting, patients who do not have chest pain present significant delays in ECG time-lag resulting in delays in treatment and higher mortality. 11-2

Emergency medical services play a critical role in the early recognition of acute acute myocardial infarction. The 12-lead prehospital electrocardiogram significantly reduces treatment times for STEMI and because it allows decreases mortality paramedics to evaluate STEMI cases and thus provide advanced notification for reception in emergency departments or, ignore a nearby hospital that does not have the capacity to perform PCI. Therefore, emergency medical services have been the focus of efforts to improve the care systems for patients with STEMI. For example, the use of 12-lead prehospital ECG by emergency medical services to diagnose IAMCSST is recommended by the American Heart Association (AHA), American College of Cardiology (ACC), the National Association of Emergency Physicians of medical services and is part of ACC / AHA for the treatment of patients with STEMI. 13

Acute myocardial infarction is a medical emergency requiring early recognition for access to definitive medical interventions. In the last decade, the diagnosis of ST-segment elevation myocardial infarction by paramedics was facilitated by advances in 12lead FCG portable cardiac monitors. **Paramedics** demonstrated accuracy reliability in the acquisition and interpretation of the 12-lead ECG, in the correct identification of STEMI and in the administration of thrombolytic agents. Early diagnosis of the paramedic and route notification to the recipient hospital reduced delays in in-hospital thrombolysis and primary percutaneous transluminal coronary angioplasty. 14

Current guidelines for referral services in cardiology recommend a 12-lead ECG for all patients who exhibit signs and symptoms of ACS. The protocols also routinely recommend Eletrocardiogram gate time in patients...

the sublingual administration of nitroglycerin to patients with persistent chest pain, in addition to those with certain exclusion criteria. However, current protocols do not differentiate the location of STEMI prior to administration of nitroglycerin. Because nitroglycerin may precipitate hypotension in patients with acute lower-wall and associated VRIG STEMI, its prehospital administration routine may not be safe. ¹⁵

Oxygen therapy has been commonly used in the initial treatment of patients with STsegment elevation myocardial infarction, based on the belief that supplemental oxygen may increase the oxygen supply to the ischemic myocardium and, therefore, reduce myocardial injury, which is supported by laboratory studies and an early clinical study. Other studies, however, have suggested a potential adverse physiological effect of supplemental oxygen, with reduced coronary blood flow, increased coronary vascular resistance, and the production of reactive that contribute oxygen species vasoconstriction and reperfusion injury. A recent meta-analysis of small randomized trials suggested a possible increase in adverse outcomes with supplemental administration. 16

CONCLUSION

Cardiovascular diseases in Brazil and in the world have one of the main causes of morbidity and mortality, with AMI and AI being the main reasons for death and hospitalization. When receiving a patient with chest pain, in order to direct a faster and more effective care, the Nursing professional must perform the ECG to define a conduct.

Therefore, it is necessary that the patient with thoracic pain, admitted to the emergency department, perform an ECG in a timely manner, since numerous potentially aggravating conditions can be detected by reading the ECG. Therefore, it is also essential that, in addition to being performed quickly, the ECG should be done correctly and effectively, a determining factor for the evaluation of suspected cases of acute myocardial infarction.

Faced with this problem, this research has as a general objective to identify, according scientific publications, the electrocardiogram gate time in patients with chest pain in the emergency room. It is concluded that the objective of this research was reached, because the literature defined that the ECG for patients with chest pain in the emergency should be done in up to ten minutes. In cohort, experimental and crosssectional studies, the vast majority

performed in cardiology reference hospitals, the ECG gate time was respected in ten minutes.

In the characterization of the studies, it was observed that the vast majority had prehospital care articles, as well, at the hospital level. In these, STEMI was shown with greater preponderance in the face of other pathologies and this justifies, therefore, its very high degree of lethality. Therefore, it is worth noting that there is no pre-hospital ECG. If there were, it would greatly reduce cases of death in patients with STEMI since, upon arrival at the hospital, coronary reperfusion measurements would be performed more quickly.

In this perspective, it is concluded that there is a need to investigate more about the ECG in several areas, such as its reading by other non-medical professionals and conducts in the face of cardiological disorders, and it is considered that a great research at the national level would be the realization of the prehospital ECG, since it would significantly reduce the cases of death in patients with STEMI.

REFERENCES

- 1. Pinto LLN, Correa AR, Donoso MTV, Matos SS, Manzo BF. Strategies for reducing door-to-balloon time in patients with acute myocardial infarction. REME rev Min enferm. 2016; 20:e954:1-10. Doi: http://www.dx.doi.org/10.5935/1415-2762.20160023
- 2. Lima SG, Diniz LR, Saraiva LCR. The prevalence of atypical presentations in patients with Acute Coronary Syndrome. Rev Soc Bras Clin Med [Internet]. 2014 Oct/Dec [cited 2017 Feb 21];12(4):282-7. Available from: http://files.bvs.br/upload/S/1679-1010/2014/v12n4/a4410.pdf
- 3. Missaglia MT, Neris ES, Silva MLT. Use of Chest Pain Protocol in a Reference Cardiology Hospital Emergency Room. Rev Bras Cardiol [Internet]. 2013 [cited 2017 Feb 14];26(5):374-81. Available from: http://www.onlineijcs.org/sumario/26/pdf/v26n5a10.pdf
- 4. Andrade KBS, Pinheiro APB, Bessa ATT, Paes GO, Stipp MAC. Evaluation of waiting times for initial electrocardiogram in patients with Acute Coronary Syndrome. Rev enferm UERJ. 2015 July/Aug; 23(4):443-8. Doi: http://dx.doi.org/10.12957/reuerj.2015.1833
- 5. Piegas LS, Timerman A, Feitosa GS, Nicolau JC, Mattos LAP, Andrade MD, et al. V Diretriz da Sociedade Brasileira de Cardiologia sobre Tratamento do Infarto Agudo do Miocárdio com Supradesnível do Segmento ST.

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Arq Bras Cardiol [Internet]. 2015 Aug [cited 2017 Feb 14];105(2 Suppl 1):1-121. Available from:

http://publicacoes.cardiol.br/2014/diretrizes/2015/02_TRATAMENTO%20DO%20IAM%20COM%20SUPRADESNIVEL%20DO%20SEGMENTO%20ST.pdf

6. Avezum A, Feldman A, Carvalho ACC, Souza ACS, Mansur AP, Guimarães AC, et al. IV Diretriz da Sociedade Brasileira de Cardiologia sobre Tratamento do Infarto Agudo do Miocárdio com Supradesnível do Segmento ST. Arq Bras Cardiol [Internet]. 2009 [cited 2017 Feb 14];93(6 Suppl 2):e179-e264. Available from:

http://publicacoes.cardiol.br/consenso/2009/diretriz_iam_9306supl2.pdf

- 7. Soares CB, Hoga LAK, Peduzzi M, Sangaleti C, Yonekura T, Silva DRAD. Integrative review: concepts and methods used in nursing. Rev esc enferm USP. 2014 Apr;48(2):335-45. Doi: http://dx.doi.org/10.1590/S0080-6234201400002000020
- 8. Patel M, Dunford JV, Aguilar S, Castilho E, Patel E, Fisher R, et al. Prehospital electrocardiography by emergency medical personnel. J Am Coll Cardiol. 2012 Aug;60(9):806-11. Doi: 10.1016/j.jacc.2012.03.071
- 9. Thang ND, Sundstrom BW, Karlsson T, Herlitz J, Karlson BW. ECG signs of acute myocardial ischemia in the prehospital setting of a suspected acute coronary syndrome and its association with outcomes. Am J Emerg Med. 2014 June;32(6): 601-5. Doi: https://doi.org/10.1016/j.ajem.2014.03.006
- 10. Coppola G, Caritá P, Corrado E, Borrelli A, Rotolo A, Guglielmo M, et al. ST segment elevations: Always a marker of acute myocardial infarction? Indian Heart J. 2013 July/Aug; 65(4):412-23. Doi: 10.1016/j.ihj.2013.06.013
- 11. Cannon AR, Lin L, Lytle B, Peterson ED, Cairns C, Glickman SW, et al. Use of prehospital 12-lead electrocardiography and treatment times among ST-elevation myocardial infarction patients with atypical symptoms. Acad Emerg Med. 2014 Aug; 21(8):892-7. Doi: 10.1111/acem.12445
- 12. Huitema AA, Zhu T, Alemayehu M, Lavi S. Diagnostic accuracy of ST-segment elevation myocardial infarction by various healthcare providers. Int J Cardiol. 2014 Dec;177 (3):825-29. Doi: 10.1016/j.ijcard.2014.11.032
- 13. Bush M, Glickman LT, Fernandez AR, Garvey JL, Glickman SW. Variation in the use of 12-lead electrocardiography for patients with chest pain by emergency medical services in North Carolina. J Am Heart Assoc.

2013 Aug;2(4):e000289. Doi:

10.1161/JAHA.113.000289

- 14. Wallen R, Tunnage B, Wells S. The 12-lead ECG in the emergency medical service setting: how electrode placement and paramedic gender are experienced by women. Emerg Med J. 2014 Oct; 31 (10):851-2. Doi: 10.1136/emermed-2013-202826
- 15. Robichaud L, Ross D, Proulx MH, Légaré S, Vacon C, Xue X, et al. Prehospital nitroglycerin safety in inferior ST elevation myocardial infarction. Prehosp Emerg Care. 2016; 20(1):76-81. Doi:

10.3109/10903127.2015.1037480

16. Stub D, Smith K, Bernard S, Nehme Z, Stephenson M, Bray JE, et al. Air versus Oxygen in ST-segment-elevation myocardial infarction. Circulation. 2016 131(24):2144-50. Doi: 10.1161/CIRCULATIONAHA.114.014494

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