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ORIGINAL ARTICLE

ASSESSMENT OF DOOR-TO-BALLOON TIME AS AN INDICATOR OF QUALITY CARE

AVALIAÇÃO DO TEMPO PORTA-BALÃO COMO UM INDICADOR DA QUALIDADE ASSISTENCIAL

EVALUACIÓN DEL TIEMPO DEL PUERTA-BALÓN COMO INDICADOR DE CALIDAD DE ASISTENCIA

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ABSTRACT

Objective: to evaluate the door-to-balloon time after the implantation of a care protocol in Acute Myocardial Infarction with ST-segment elevation. ***Method:*** this is a quantitative, descriptive, observational, retrospective study, obtaining data through medical records made available by the Statistical Medical Support Service and by the Cardiac Emergency, organizing them chronologically, in five groups, with 44 medical records, as an indicator of quality of care and then analyzing them from the statistics of measures of mean and standard deviation. ***Results:*** 220 medical records were evaluated. A reduction in door-to-balloon time was identified, from 121 ± 56 minutes in the first group to 100 ± 33 minutes, compared to the second; subsequently, there was a progressive increase, with 112 ± 40 minutes in the third, 126 ± 46 minutes in the fourth and 123 ± 36 minutes in the last group. ***Conclusion:*** it was found that, after the implementation of the protocol, there was a shortening of the door-to-balloon time in the short term, thus inferring the possibility of lower performance in care quality. ***Descriptors***: Cardiovascular Diseases; Angioplasty Balloon Coronary; Acute Coronary Syndrome; Myocardial Infarction; Clinical Protocols; Quality of Health Care.

RESUMO

Objetivo*:** avaliar o tempo porta-balão após a implantação de um protocolo de atendimento no Infarto Agudo do Miocárdio com Supradesnivelamento do Segmento ST. ***Método*:** trata-se de um estudo quantitativo, descritivo, observacional, retrospectivo, obtendo-se os dados por meio de prontuários disponibilizados pelo Serviço de Apoio Médico Estatístico e pela Emergência Cardiológica, organizando-os cronologicamente, em cinco grupos, com 44 prontuários, como indicador da qualidade assistencial e, em seguida, analisando-os a partir da estatística de medidas de média e desvio-padrão. ***Resultados*:** avaliaram-se 220 prontuários. Identificou-se redução do tempo porta-balão, de 121 ± 56 minutos no primeiro grupo para 100 ± 33 minutos, comparado ao segundo; posteriormente, constatou-se progressivo aumento, sendo 112 ± 40 minutos no terceiro, 126 ± 46 minutos no quarto e 123 ± 36 minutos no último grupo. ***Conclusão: constatou-se que, após a implantação do protocolo, houve a diminuição do tempo porta-balão em curto prazo, inferindo-se, assim, a possibilidade de menor desempenho na qualidade assistencial. ***Descritores*:** Doenças Cardiovasculares; Angioplastia Coronária com Balão; Síndrome Coronariana Aguda; Infarto do Miocárdio; Protocolos Clínicos; Qualidade da Assistência à Saúde.

RESUMEN

Objetivo: evaluar el tiempo puerta-balón, después de la implementación de un protocolo de atención en el Infarto Agudo de Miocardio con Elevación del Segmento ST. ***Método:*** este es un estudio cuantitativo, descriptivo, observacional, retrospectivo, que obtiene datos a través de registros médicos puestos a disposición por el Servicio Estadístico de Apoyo Médico y por la Emergencia Cardíaca, organizándolos cronológicamente, en cinco grupos, con 44 registros médicos, como indicador de la calidad de la atención, luego analizándolos a partir de las estadísticas de medidas de desviación media y estándar. ***Resultados:*** se evaluaron 220 registros médicos. Se identificó una reducción en el tiempo de puerta-balón, de 121 ± 56 minutos en el primer grupo a 100 ± 33 minutos, en comparación con el segundo, posteriormente, se encontró un aumento progresivo, con 112 ± 40 minutos en el tercero, 126 ± 46 minutos en el cuarto y 123 ± 36 minutos en el último grupo. ***Conclusión***: se encontró que después de la implementación del protocolo, hubo una disminución del tiempo puerta-balón a corto plazo, lo que infiere la posibilidad de un menor rendimiento en la calidad de la atención. ***Descriptores***: Enfermedades Cardiovasculares; Angioplastia Coronária com Balón; Síndrome Coronario Agudo; Infarto del Miocárdio; Protocolos Clínicos; Calidade de la Atención de Salud.

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INTRODUCTION

It is known that the demographic transition that the country has been experiencing is the result, among other factors, of a recent reduction in mortality coupled with an aging population. It is characterized by a population profile with a longer life expectancy, however, with a high number of comorbidities. Among the main causes of morbidity and mortality in Brazil, and similarly in the world, Cardiovascular Diseases (CVD) is found.[1]

It is pointed out that diseases of the circulatory system, the second leading cause of hospitalization in Brazil, were responsible, in 2015, for 27.6% of deaths, of a total of 1,264,174 cases. It was noted, in the same period, that the number of deaths due to ischemic heart diseases was 111,863 cases.[2] Among the ischemic heart diseases, we highlight the Acute Coronary Syndromes (ACS), which comprise Unstable Angina and Acute Myocardial Infarction (AMI), with or without ST-segment elevation.[3]

It is observed that most ST segment elevation AMIs are caused by occlusion of an epicardial artery. This outcome is explained by the rupture of an atherosclerotic plaque with the formation of an occlusive thrombus at the site, vasospasm and micro-embolisms, which limits blood flow to the myocardium and, consequently, the oxygen supply. Thus, reperfusion therapies are recommended in the treatment of AMI in order to cease the discomfort resulting from myocardial ischemia, as well as its complications.[4]

The primary Percutaneous Coronary Intervention strategy instead of chemical thrombolysis was adopted in several health services in Brazil as a treatment for reperfusion of patients with AMI with ST-segment elevation. It should be noted, however, that its effectiveness depends on a rapid onset of treatment, considering the time between the patient's arrival at the hospital and the onset of angioplasty.[5]

It is defined, according to the V guideline of the Brazilian Society of Cardiology (BSC) on the treatment of AMI with ST segment elevation, that the ideal time of arrival at the hospital's entrance door until the primary Percutaneous Coronary Intervention procedure, also defined as Door-to-Balloon Time (DBT), must be ≤ 90 minutes.[6]

It is noteworthy that a series of quality indicators has been recommended to assess the quality of care provided to patients hospitalized with AMI, for example, door-to-ECG time; DBT or door-to-needle time; prescription rate for Acetylsalicylic Acid (ASA) in the first 24 hours of hospitalization; ASA prescription rate at hospital discharge; rate of beta-blocker prescription at hospital discharge; prescription rate of angiotensin-converting enzyme inhibitor/angiotensin receptor blocker at hospital discharge and hospital mortality rate due to AMI.[7-4]

Through the availability of quality indicators, the monitoring of health objectives and goals and the encouragement to strengthen the analytical capacity of teams are facilitated. It is inferred, therefore, that an important step to promote changes is to identify indicators that can help to evaluate a particular care practice and, thus, monitor it to make it as close as possible to the ideal or according to what is recommended the most current guidelines.[8]

Thus, the evaluation of DBT in cardiology services is essential. It is understood that the reduction in DBT has a direct impact on the patient's clinical outcomes, as pointed out by a survey conducted from a French registry in hospitals across the country, with (N = 1289) patients with AMI with Segmentation Elevation ST who underwent primary Percutaneous Coronary Intervention. In the research, it was concluded that early in-hospital mortality was lower when the time intervals recommended for reperfusion therapy were obeyed. Thus, it was pointed out that compliance with the current guidelines for care intervals is extremely relevant.[9]

OBJECTIVE

- To evaluate the door-to-balloon time after the implantation of a care protocol in Acute Myocardial Infarction with ST-segment elevation.

METHOD

This is a quantitative, descriptive, observational study, with retrospective analysis, between May 2017 and March 2018, in a cardiological emergency of a reference hospital in Cardiology in the State of Pará, Brazil.

It is noteworthy that the emergency *in loco* did not have screening with a risk classification; however, a chest pain protocol based on the Chest Pain Guideline in the BSC Emergency Room was followed. The protocol was carried out between two different sectors of the hospital: the Cardiological Emergency sector, responsible for identifying chest pain, diagnosis, preparation of the patient for the procedure and activation of the Interventional Cardiology team of the hemodynamics service and the Hemodynamics sector, where the Interventional Cardiology team responsible for carrying out the mechanical reperfusion procedure.

It is also emphasized that the site, as part of the Good Clinical Practice in Cardiology Program, had, as goals to be achieved during the care of patients with AMI with ST Segment Elevation, an ECG door ≤ 10 minutes and a DBT ≤ 90 minutes, as recommended by the BSC.

Medical records of patients of both sexes were used as inclusion criteria; aged ≥ 18 years; diagnosed with ST segment elevation AMI (ICD 10 I21), defined by medical criteria, and who had undergone primary Percutaneous Coronary Intervention; with less than 12 hours of chest pain and hospitalized in cardiac emergency and, as exclusion criteria, cases of incomplete medical records; of patients aged <18 years; with more than 12 hours of pain and who have undergone Percutaneous Coronary Intervention to rescue.

Data was obtained from medical records made available by the Statistical Medical Support Service and by the Cardiac Emergency. It was observed the time of care of patients who met the inclusion criteria in order to monitor the behavior of the DBT interval after the implementation of the chest pain protocol. The data was organized chronologically, divided into five groups, each with 44 medical records.

For the identification of DBT (≤ 90 min and> 90 min) and other variables (Door-ECG, ECG-Decision, Decision-End of patient preparation, End of patient preparation-Beginning of Percutaneous Coronary Intervention), Start of PCI-Baloon, Decision - Arrival of Interventionist, Decision - Start of Percutaneous Coronary Intervention), measures of mean and standard deviation.

The research project for this study was approved by the Research Ethics Committee of the State Public Foundation Hospital das Clínicas Gaspar Vianna under opinion number 2,527,630.

RESULTS

A total of 220 records were evaluated. It was found that 74 (33.6%) patients had DBT ≤ 90 min and 146 (67.4%) had time> 90 min. The measures (mean and standard deviation) of DBT and other variables are described in tables 1 and 2.

Table 1. Variables of the chest pain protocol of patients who had DBT ≤ 90 min in a reference hospital in Cardiology. Belém (PA), Brazil, 2018.

Variables	Average	Standard deviation
Door-Baloon	75 min	11min
Door-ECG	9 min	7 min
ECG-Decision	8 min	6 min
Decision - End of patient preparation	13 min	7 min
End of patient preparation - Beginning of PCI	24 min	11 min
Start of PCI - Balloon	21 min	8 min
Decision - Arrival of the Interventionist	27 min	10 min
Decision – Beginning of PCI	36 min	12 min
Total Medical Records: 74		

Note: PCI = Percutaneous Coronary Intervention

Table 2. Variables of the chest pain protocol of patients who had DBT> 90 min in a referral hospital in Cardiology. Belém (PA), Brazil, 2018.

Variables	Average	Standard deviation
Door-Baloon	137 min	44 min
Door-ECG	17 min	16 min
ECG-Decision	21 min	24 min
Decision - End of patient preparation	27 min	39 min
End of patient preparation - Beginning of PCI	59 min	45 min
Start of PCI - Balloon	30 min	13 min
Decision - Arrival of the Interventionist	62 min	36 min
Decision – Beginning of PCI	71 min	36 min
Total Medical Records: 146		

Note: PCI = Percutaneous Coronary Intervention

It was found, considering the data ordered in groups, that DBT, in most cases, presented an average above the time recommended by the chest pain protocol, that is, DBT> 90 min. It was also observed that there was a slight improvement in that time, comparing the first two groups, as shown in table 3.

Table 3. Door-to-Baloon time found, according to their respective groups, in a reference hospital in Cardiology. Belém (PA), Brazil, 2018.

Groups	Medical records	DBT(Average/Standard deviation)
First	44	121 /± 56 minutes
Second	44	100 /± 33 minutes
Third	44	112 /± 40 minutes
Fourth	44	126 /± 46 minutes
Fifth	44	123 /± 36 minutes
Total Medical Records: 220		

DISCUSSION

It is noteworthy that, in recent years, national health institutions have also sought to measure DBT and have presented results that are not ideal, which corroborates this study, such as a research that sought to describe the practice of prescribing treatments, with indication based on guidelines for patients with ACS in Brazil, carried out from the Registry of Clinical Practice in ACS, which covered the Brazilian territory through 65 centers in public and private institutions. It should be added that the registration occurred from January 2011 to December 2012 and included the population of 633 patients with ST segment elevation AMI, so that 64.04% of the cases had a DBT over 90 minutes.[10]

It is pointed out that, in the United States, where there has been a longstanding performance in improving care time indicators, a study carried out in a university hospital, between 2007 and 2010, with 120 patients, it presented an average DBT of 71 minutes, since the institution had as a goal a 60-minute indicator, much more demanding than that established by the American Heart Association.[11]

It is understood that, despite the fact that this study did not include an assessment of the DBT before carrying out improvement actions in the service, it is important to take into account that these results may be related to the fact that the institution, in May 2017, carried out an orientation action with the medical and nursing teams of the Cardiological Emergency sector and the Hemodynamics service in order to familiarize the team with the BSC guidelines and pass on information related to the time of assistance to patients with AMI with ST-segment elevation , which may have led to an initial adhesion of the actions, however, without effectiveness over the months.

It is also possible, considering other possible factors, such as the temporary inactivation of one of the hemodynamic rooms due to the maintenance of equipment, to justify the increase in the average of the DBT during the studied period.

In the national scenario, as well as in this study, there is a great challenge in achieving results of a DBT ≤ 90 minutes. It is emphasized that the adoption of hospital work processes in a systematic way is an effective formula to reduce DBT, avoiding unnecessary delays caused by bureaucracy, diagnostic delay, activation of teams or even in the treatment of AMI.[12]

It is understood that maintaining a low DBT is a daily and laborious task, however, rewarding for the patient. This time can be related, in large part, to the displacement of the interventional cardiologist to the place where the primary Percutaneous Coronary Intervention is performed after activation by telephone contact.[12]

It was identified, in a research, that this time interval, if reduced, would further anticipate the realization of the primary Percutaneous Coronary Intervention. Thus, a team of Interventional Cardiology with 24h presence was implanted in the hospital submitted to the research, replacing the alert and, thus, eliminating possible prolonged trips of the team to the hospital, which resulted in a 57% reduction in DBT.[13]

It is emphasized, however, that incentive programs for the improvement of quality indicators in cardiological health have been put into practice worldwide. In Europe, for example, Stent for Life, an international project promoted by the coalition of the European Association of Percutaneous Cardiovascular Interventions and EuroPCR. It seeks, from it, to improve the treatment provided to victims of AMI by adhering to practices based on scientific evidence.[14]

CONCLUSION

It was found that, after the implementation of the chest pain protocol, there was a decrease in DBT in the short term, thus inferring the possibility of lower performance in the quality of care offered. It is pointed out that the monitoring of DBT in services would enable an evaluation of its effectiveness as a quality indicator. It is emphasized, moreover, that this survey, in addition to presenting itself as an evaluative means, could produce results that would serve as a basis for the implementation of measures that seek to correct flaws in the service and, thus, guarantee the quality of care long term.

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