Access of patients with myocardial infarction to cardiology reference hospitals

Acesso de usuários com infarto do miocárdio a hospitais referência em cardiologia

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Abstract

Objectives: Characterize the access of patients with myocardial infarction to cardiology reference hospitals

Methods: Cross-sectional study conducted in two cardiology reference hospitals. A sample of 100 patients, with a diagnosis of myocardial infarction, was interviewed employing a specific instrument. Mean, standard deviation and percentage values were used in the analysis.

Results: Male subjects; black skin; married; low socioeconomic status and mean age of 56.4 years predominated. The onset of symptoms at home, use of inadequate means of transportation, emergency service as the first place sought for assistance; and admission to cardiology reference hospitals up to the third medical assistance prevailed. Of the 67 patients with myocardial infarction with ST segment elevation, 12% received reperfusion therapies. The lack of resources was the main reason for the pilgrimage within the healthcare system.

Conclusion: Use of inappropriate means of transportation, low proportion of myocardial reperfusion, and lack of structure of the healthcare network to deliver care related to the infarct was observed.

Resumo

Objetivo: Caracterizar o acesso de usuários com infarto do miocárdio a hospitais referência em cardiologia.

Métodos: Estudo transversal, realizado em dois hospitais referência em cardiologia. A amostra de 100 usuários, com diagnóstico de infarto, foi entrevistada empregando-se instrumento específico. Na análise utilizou-se médias, desvio padrão e percentuais.

Resultados: Predominaram homens, raça negra; casados; baixo nível socioeconômico, idade média de 56,4 anos. Prevaleceu início dos sintomas no domicílio, uso de meios de deslocamento inadequados, procura de serviço de emergência como primeiro local de atendimento, admissão nos hospitais referência em cardiologia até o terceiro atendimento. Dos 67 usuários com infarto com supradesnível do segmento ST, 12% receberam terapias de reperfusão miocárdica. A insuficiência de recursos foi a principal razão para a peregrinação na rede de saúde.

Conclusão: Constatou-se uso de meios de transporte inapropriados, baixa proporção de reperfusão miocárdica e falta de estrutura da rede para atendimento ao infarto.

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Introduction

Cardiovascular diseases are still the main cause of death and disability in Brazil and worldwide. Each year, 17.3 million deaths occur because of these diseases, and it is estimated that 40% of deaths will be related to them in 2020.[1] In Brazil, in 2010, 326,345 deaths occurred from cardiovascular diseases and, of this total, 79,662 were due to myocardial infarction.[2]

Myocardial infarction represents more than 80% of the cases of ischemic heart disease, being considered the most lethal[3] and significant cardiovascular disease. One of the factors contributing to the decline in mortality from myocardial infarction is the prompt medical care, since most deaths occur in the first hour after the onset of symptoms.[4,5]

The success of the treatment is associated with early initiation of chemical or mechanical coronary reperfusion therapies.[5] These therapies modify the progression of the disease, however, their effectiveness is time-dependent,[5] that is, the earlier the initialization the greater the therapeutic benefit.

Although the Brazilian health system is regarded as universal, it may not be able to guarantee patients with infarction access to appropriate care. The difficulty of access to health services of higher level of complexity has been identified as one of the factors favoring the fragmentation of health care.[6] The deficiencies in the provision and organization of the services delivered by the Unified Health System (SUS, as per its acronym in Portuguese) expose individuals to a difficult journey in pursuit of health care. During this pursuit, patients with infarction go through numerous health services, resulting in delay to obtain an effective treatment,[7] increased risk of morbidity and mortality and increased treatment costs for individuals and society.

Thus, it is necessary to learn how the access to public healthcare services is presented to patients with myocardial infarction, in order to support measures that optimize a specialized treatment. Access to these services can be configured differently, due to the specificities of healthcare networks in different countries or regions, and little is known about it in the national literature.

Given the aforementioned, the objective of this study was to characterize the access of patients with myocardial infarction to cardiology reference hospitals.

Methods

Cross-sectional study, conducted in two cardiology reference hospitals, in the city of Salvador, state of Bahia, northeastern Brazil. One institution is philanthropic and admits people for treatment through private health insurance agencies and through the Unified Health System; the other institution is public and admits people through the Public Regulation System of the state of Bahia.

The estimated prevalence for myocardial infarction of 99/100000 adults in Salvador, Bahia, was used as parameter to calculate the sample size (n) of 100 individuals.[8] The following parameters were also considered in the calculation of the sample:

$$n = \frac{NP\,(1-P)}{(N-1)\,D + P\,(1-P)} \quad \text{in which,} \quad D = \frac{B^2}{Z_{a/2}} \quad \text{and} \quad B = 1 - a\,P$$

N - total number of the population assumed during the period of data collection = 1000; P - proportion within the population studied = 0.099; n - sample size; a - significance level; (1 − a) 100 - confidence level; B - maximum estimated error desired; $Z_{a/2}$ = 1,96; 1 − a = 0,95, B = 0,04 or 4%.

Inclusion criteria were having a diagnosis of myocardial infarction with or without ST segment elevation, being hospitalized for at least 24 hours and the maximum of 20 days, being oriented in space and time and without medical restrictions for the interview.

The data collection instrument consisted of three parts with structured questions. Part I, Sociodemographic Characterization, examined data on the place of hospitalization, age, gender, self-declared ethnicity, schooling, marital status, employment status, household income, household members, number of dependents, place of residence and possession of a health insurance plan. Part II, Clin-

ical Characterization, was aimed to obtain information regarding the type of infarction, execution of myocardial reperfusion and clinical manifestations of the infarction. Part III, Characterization of Access to Health Services, collected data regarding the location, date and time of symptom onset, means of transportation used, type and the number of health services accessed before being admitted to a cardiology reference hospital, the conducts of health professionals in the first place of assistance and knowledge of the participants on the health service that should be sought.

Data were collected by means of interviews conducted in inpatient units, the coronary care unit and the semi-intensive care unit. After the identification of individuals in the logbook and medical records, those who met the inclusion criteria and who were not scheduled for exams and/or procedures for an hour were selected. All data were obtained through the interview, except for the medical diagnosis that was verified in the medical record and confirmed with the physician assistant, as well as the date and time of hospital admission and the registration of myocardial reperfusion.

The data obtained were processed using the statistical software Stata, version 11.0. In the analysis, mean, standard deviation and percentage values were used. Data were presented in tables.

The development of this study complied with national and international ethical guidelines for research involving human subjects.

Results

Sociodemographic and clinical characteristics of the participants

Of the 100 individuals who suffered infarction, 71 were men, with a mean age of 58.7 years (SD 11.1) and 29 were women, with a mean age of 59.0 years (SD 12.1). Most were aged <60 years (56%). Predominant origin was Salvador and the Metropolitan Region (73%), black skin (71%), married/stable union (75%), low schooling (56% had completed elementary school and 13% were illiterate), monthly family income of up to three minimum wages (63%), up to 3 family members living on this income (58%), active employment status (67% were economically active, that is, employed, self-employed or retired with activity). Most lived with someone, a greater proportion with a partner (69%) and child/stepchild (65%).

Most individuals showed infarction with ST segment elevation (67.0%). Of these, 88% had no medical records of myocardial reperfusion. The predominant symptom was pain in the chest (81%), followed by sweating (66%) and respiratory distress (47%). The description of chest tightness (45%) predominated, followed by burning (36%), lasting more than 15 minutes (96%) and characterized as intensive (83%). Of the 89% of individuals who informed the frequency of pain, 74.2% characterized it as constant/uninterrupted.

Characterization of the access of participants to the first health service

The majority (76%) of the participants was at home when infarction symptoms started, followed by those at thoroughfares (18%) (Table 1).

The use of one's own automobile/that belonging to acquaintances or a taxi (70%) to get to the health service prevailed. Only 11% of the participants used the ambulance service and, of these, 3% used regular ambulance and 8% used the Mobile Emergency Medical Service (SAMU, as per its acronym in Portuguese). (Table 1).

Regarding the type of health service sought for the first medical assistance, 89% sought an urgency and emergency service. Although most sought for the adequate service, 77% did not know which service was indicated for the treatment of myocardial infarction (Table 1).

At the time of occurrence of the cardiovascular event, 76% were in Salvador and in the Metropolitan Region. In the case of these individuals, the authors tried to identify the existence of an emergency service in the health district of their residence/stay, and it was not possible to obtain such information for three men. Thus, 84.9% of the 73 participants were in neighborhoods of Salvador that offered healthcare coverage. Knowing that 73 participants

Table 1. Characterization of the access of participants to the first health service sought after the onset of myocardial infarction symptoms

Characteristics related to the access of the participants	n(%)
Place of symptom onset (n=99)*	
Home	76(76.8)
Thoroughfare	18(18.2)
Work	5(5.1)
Means of transportation (n=99)*	
Mobile emergency medical unit / Regular ambulance	11(11.1)
Automobile / Cab / Motorcycle	72(72.7)
Bus/Walking	16(16.2)
Type of health service sought as the first place of assistance	
Service with urgency and emergency assistance **	89(89.0)
Service without urgency and emergency assistance***	11(11.0)
Mentioned knowing where to seek for health care	
Yes	23(23.0)
No	77(77.0)
Existence of emergency unit in the neighborhood of residence / stay in Salvador (n=73)****	
Yes	62(84.9)
No	11(15.1)
Sought the health services from the neighborhood of residence / stay in Salvador (n=50)*****	
Yes	39(78.0)
No	11(22.0)
Conduct of health professionals in the first place for care	
Expected conducts	82(82.0)
Unexpected conducts	18(18.0)

*One woman was in a health service performing exams when infarction symptoms started. **Open access hospital/Cardiology reference hospital/Emergency unit/Mobile emergency medical unit/***Outpatient Service/Primary Healthcare Unit. ****For users who were in Salvador and in the Metropolitan Region at the time of symptom onset; *****For users who were in Salvador, in the Metropolitan Region and at home at the time of symptom onset

had an emergency unit in their health district, the authors identified those who were at home when the symptoms started. Of the 50 participants who were at home, 78.0% sought healthcare facilities belonging to the district (Table 1).

Regarding the conducts of health professionals in the first health service sought, for 82% of the participants the conducts were the ones expected (assisted and admitted or assisted, admitted and transferred). It is noteworthy that 18% were victims of unexpected conducts such as denial of service (6%), medical assistance and orientation to find another service (6%), medical assistance and subsequent discharge (4%), medical assistance and orientation to follow up with a cardiologist (2%), (Table 1).

Characterization of the access of participants to cardiology reference hospitals after searching for the first health service

In the public health network of Salvador, Bahia, and in the Metropolitan Region, the access of patients to cardiology reference hospitals does not happen directly, but through the central regulation. Thereby, participants must have passed by at least one health service prior to admission in these hospitals.

On average, participants passed by 1.6 (SD 0.9) services before admission to cardiology reference hospitals, which occurred for most of them in the second (60.6%) and in the third assistance (29.3%).

Table 2 shows the various types of health services visited by the participants until admission to the cardiology reference hospitals. With the exception of one participant who was admitted in the first visit, all others had to resort to another assistance before admission in the study sites. Most sought emergency services for first medical assistance, but 11 went to outpatient services or primary healthcare units.

Table 3 shows the conduct of health professionals for the 99 participants who were assisted at least once before admission to cardiology reference hospitals. In 80.1% of the 156 assistances received the conduct was "assistance, admission and subse-

Table 2. Types of health services sought according to the order of assistance received before admission to the cardiology reference hospitals

Type of health service	Número de serviços de saúde procurados						
	First n=100)	Second n=99	Third n=39	Fourth n=10	Fifth n=5	Sixth n=2	Seventh n=1
Hospital	41	22	9	4	2	1	-
Emergency Unit	39	12	1	1	-	-	-
Mobile Emergency Service	8	1	-	-	-	-	-
Outpatient Service	7	4	-	-	-	-	-
Primary Healthcare Unit	4	-	-	-	-	-	-
Admission to cardiology reference hospitals*	1	60	29	5	3	1	1
Total	100	99	39	10	5	2	1

*Number of the participants admitted to cardiology reference hospitals according to the number of health services visited

Table 3. Conducts of health professionals distributed by type of health service sought

Conducts of health professionals	Hospital n(%)	Emergency Unit n(%)	SAMU* n(%)	Primary Healthcare Unit n(%)	Outpatient Service n(%)	Cardiology Reference Hospitals n(%)	Total n(%)
Medical assistance, admission and subsequent transfer	61(78.2)	51(96.2)	9(100.0)	2(50.0)	2(18.2)	-	125(80.1)
Medical assistance and orientation to look for another service	5(6.4)	-	-	1(25.0)	7(63.6)	-	13(8.3)
Denial of assistance	7(9.0)	1(1.9)	-	1(25.0)	1(9.1)	1(100.0)	11(7.1)
Medical assistance and subsequent discharge	4(5.1)	1(1.9)	-	-	-	-	5(3.2)
Medical assistance and orientation to look for a cardiologist	1(1.3)	-	-	-	1(9.1)	-	2(1.3)
Total	78(100.0)	53(100.0)	9(100.0)	4(100.0)	11(100.0)	1(100.0)	156(100.0)

* Mobile Emergency Medical Service – SAMU, as per its acronym in Portuguese

quent transfer", especially in hospitals and emergency units. However, 19.9% of conducts were unexpected, both in minor and more complex services. Such conducts were described by participants as medical assistance and orientation to look for another service; denial of assistance; medical assistance and subsequent discharge or orientation to look for a cardiologist.

The 99 participants who underwent more than one service reported 156 reasons for going to another health service, such as insufficient resources (141 - 90.4%), followed by denial of care (7 - 4.5%), discharge after care (5 - 3.2%) and orientation to look for another service (3 - 1.9%). Of the 141 times that the lack of resources was mentioned, most of the times, the participants were unable to inform the type of resource unavailable (107 - 75.9%). When informed by the participants, the reasons that predominated were: impossibility to perform catheterization and percutaneous transluminal angioplasty (23 - 16.3%), impossibility to deliver emergency care (2.8%) and to conduct electrocardiograms (2 - 1.4%). Also, service overcrowding (3 - 2.1%) and absence of a physician/cardiologist (2 - 1.4%) were highlighted as reasons.

Discussion

The limits of the results of this study are related to the cross-sectional method that does not allow the establishment of cause and effect relations. The study contributed to greater understanding of the access of patients with myocardial infarction to public health services, in the sample studied. Its results are relevant to guide the actions of health managers and professionals, as they evidence the gaps in the care of patients with infarction in the healthcare network.

Male subjects were predominant, as it was also observed in other national studies,[1,9] as well as age the group under 60 years, noting that women developed infarction at an early age, when considering the presence of early coronary artery disease in women aged ≤ 65 years and in men ≤ 55 years.[10] The predominant marital status was married/with a partner, in agreement with other studies.[9,11]

Participants had similar socioeconomic characteristics, expressed by the dependence on the Unified Health System, low level of schooling and low family income. Also, one third was professionally inactive, due to unemployment or retirement.

These findings evidence deficient socioeconomic conditions, which are associated with an increased risk of death from cardiovascular disease.[12]

Most participants declared themselves as having black skin, a determining aspect to a high risk for cardiovascular events.[13]

Most participants presented a typical clinical profile of myocardial infarction due to the nature and characteristics of the chest pain,[5] and they were at home when the symptoms started. In the space of the house, surrounding people, such as family members and friends, have a fundamental role in optimizing the access of the individual to a health service, be it for the recognition of the severity of the situation or when alerted by the victims. To this end, the community in general needs to be trained, especially, to recognize cardiovascular events and to alert the emergency medical service.

Most participants used inappropriate transportation to go to the health service. A low percentage called the Mobile Emergency Medical Service, although this is the means recommended since it is equipped with human and material resources for the first medical assistance.[14] Other national studies[9,15] have also found that this service is poorly used, demonstrating that this situation still persists. Its low use may reflect the lack of knowledge or appreciation of its importance by the participants or indicate negative experiences regarding their performance in the city under study. Regarding this aspect, studies revealed problems in the time-response of this service in Brazilian cities.[16,17]

For the first medical assistance, most participants went to an urgency and emergency service. However, most reported not knowing where to seek treatment at the time of a cardiovascular event. The discomfort caused by the infarction symptoms and the potential severity associated with them may have contributed to the pursuit of this type of service.

Participants who had an emergency unit in the health district of their place of residence / stay and were at home when the symptoms started sought a service in their district, which is expected in the infarction service network in Salvador, Bahia, when the service offers emergency care. It is important that users be educated about the appropriate service that can assist with their clinical condition and about its location, aiming the early treatment. Therefore, dissemination of information to the community about emergency services near the region of residence and place of work is necessary. Such information may be provided by nurses in various scenarios of action, as in primary care during monitoring programs as the HIPERDIA, considering that diabetes and hypertension are cardiovascular risk factors, and in the health education activities performed in the home and community settings. This information should also be offered to people with cardiovascular disease or with a potential risk for cardiovascular events, hospitalized or in outpatient services, as well as to their families.

Although there was a greater proportion of individuals who reported experiencing expected professional conducts in the first place of care, a portion was victim of misconduct, which was expressed in the form of lack of structure of the institutions and difficulty of clinical management of health professionals when caring for patients with infarct.

Most participants suffered infarction with ST-segment elevation similar to the proportion recorded by Ferreira et al. (2009). Among those with this type of infarction, only 12% were reperfused. Although some may not have met the criteria for myocardial reperfusion, these findings indicate exposure to a higher risk of death and complications and reiterate the need for optimization and qualification when caring for patients with infarct. There are reports of low prevalence of myocardial reperfusion in Brazilian cities in the literature.[1,19] In Salvador, Bahia, despite the creation of a network of care for infarction patients, Solla et al. (2013)[20] found that of 287 patients with myocardial infarction with ST-segment elevation, only 90 underwent myocardial reperfusion therapies.

Therefore, despite advances in the knowledge of the treatment of the disease, it is still necessary to qualify and prepare health professionals to diagnose and treat it,[19] and to improve public health services for the early implementation of therapeutic reperfusion.

The participants, on average, went through 1.6 health services before being admitted to a cardiol-

ogy reference hospital, which happened mostly in the second assistance received. It was expected that the admission did not occur in the first assistance because these hospitals only admit referred people. However, needing to receive assistance two or more times, before the admission to the hospital, was not expected. The research findings showed that the number of times people received assistance before hospitalization was associated with significant delays in having access to specialized care. Having to go to various health services and the unexpected conducts faced in these services, exposed the participants to higher morbidity and mortality risks and showed a deficiency in the municipal health network.[21]

The lack of structure of health services in the city was evident by the insufficient resources in the first institutions sought. This lack of structure has been observed from December 2003 to June 2004, showing that the conditions for early treatment for acute coronary syndromes appear to have had no significant changes.[21]

Individuals with infarction need to rely on a network of health services that is prepared to assist them.[22] Therein lies the importance of public policies that aim to organize the healthcare network with equipment, materials and skilled human resources. However, it is worth noting that the success of care depends not exclusively on the establishment of infarction care networks, but also on the commitment and scientific and technical quality of health professionals and on the awareness of the patients and the surrounding people to seek an emergency service early.

Conclusion

Use of inadequate means of transportation; emergency health services as first place for assistance; and medical assistance, admission and subsequent transfer as the most frequent conduct were predominant characteristics for individuals with infarction. Few individuals with myocardial infarction with ST-segment elevation underwent myocardial reperfusion. Admission to cardiology reference hospitals occurred mainly in the second service accessed, as it was expected; however, a significant portion had to

rely on the third service due mainly to the lack of resources in the first services sought.

Collaborations

Mendes AS; Reis VRSS and Mussi FC participated in the project conception and development of the phases of the study, drafting of the article, adaptation to the journal's guidelines and final approval of the version to be published. Menezes TMO collaborated with the data analysis and final approval of the version to be published. Santos CAST contributed with the project conception and with the analysis and interpretation of data.

References

1. Soares JS, Souza NR, Nogueira FJ, Cunha CC, Ribeiro GS, Peixoto RS, et al. [Treatment of a cohort of patients with acute myocardial infarction and ST-segment elevation]. Arq Bras Cardiol. 2009; 92(6):464-71.

2. Brasil. Ministério da Saúde. Datasus. Indicadores de Saúde. [Internet]. [citado 2013 Fev 10]. Disponível em: http://tabnet.datasus.gov.br/cgi/deftohtm.exe?sim/cnv/obt10uf.def.

3. Acosta González M, Hernandez Valdés E, Nadal Tur B, Castellano Almeida, Herrera Giró ML. Evaluación de lasacciones de enfermería en el tiempo puerta aguja en pacientes com tratamiento trombolítico. Rev Cubana Enferm. 2011; 27(1):79-87.

4. Mussi FC, Ferreira SL, Menezes AA. [Experiences of women in face of pain from acute myocardial infarction]. Rev Esc Enferm USP. 2006; 40(2):170-8. Portuguese.

5. Sociedade Brasileira de Cardiologia. IV Diretriz sobre o Tratamento do Infarto Agudo do Miocárdio com Supradesnível do Segmento ST. Arq Bras Cardiol. 2009; 93(6 Supl 2): e179 - e264.

6. Silva SF. [The organization of regional and integrated healthcare delivery systems: challenges facing Brazil's Unified Health System]. Ciênc & Saúde Coletiva. 2011; 16(6):2753-62. Portuguese.

7. Mussi FC, Mendes AS, Queiroz TL de, Costa AL, Pereira A, Caramelli B. [Pre-hospital delay in acute myocardial infarction: judgement of symptoms and resistance to pain]. Rev Assoc Med Bras. 2014; 60(1):63-9. Portuguese.

8. Lessa I. Epidemiologia das doenças cerebrovasculares no Brasil. Rev Soc Cardiol. Estado de São Paulo. 1999; 9(4):509-18.

9. Sampaio ES, Mendes AS, Guimarães AC, Mussi FC. Percepção de clientes com infarto do miocárdio sobre os sintomas e a decisão de procurar atendimento. Cienc Cuid Saúde. 2012; 11(4):687-96.

10. Sociedade Brasileira de Cardiologia; Sociedade Brasileira de Hipertensão; Sociedade Brasileira de Nefrologia. VI Diretrizes Brasileiras de Hipertensão. Arq Bras Cardiol. 2010; 95 (1 Supl 1):1-5.

11. Bastos AS, Beccaria LM, Contrin LM. [Time of arrival of patients with acute myocardial infarction to the emergency department]. Rev Bras Cir Cardiovasc. 2012; 27(3):411-8. Portuguese.

12. Girotto E, Andrade SM, Cabrera MA, Ridão EG. [Prevalence of risk factors for cardiovascular diseases among people with hypertension enrolled in a family health unit]. Acta Scientiarum Health Sciences. 2009; 31(1):7-82. Portuguese.

13. Lessa I, Araújo MJ, Magalhães L, Filho NA, Aquino E, Costa MC. [Clustering of modifiable cardiovascular risk factors in adults living in Salvador (BA), Brazil].. Rev Panam Salud Publica. 2004; 16(2):131-7. Portuguese.

14. Perkins-Porras L, Whitehead DL, Strike PC, Steptoe A. Pre-hospital delay in patients with acute coronary syndrome: Factors associated with patient decision time and home-to-hospital delay. Eur J Cardiovasc Nurs. 2009; 8(1):26-33.

15. Figueiredo AE, Siebel AL, Luce DC, Schneider I. Determinação do tempo de apresentação a emergência de pacientes com infarto agudo do miocárdio. Rev Enferm UFSM. 2013; 3(1): 93-101.

16. Morais DA, Carvalho DV, Timerman S, Gonzalez MM. [Out-of-hospital cardiac arrest: cases assisted by the mobile emergency service of Belo Horizonte]. Rev Bras Clin Med. 2009; 7(4):211-8. Portuguese.

17. Silva NC, Nogueira LT. [Evaluation of operational indicators in a mobile emergency care service]. Cogitare Enferm. 2012; 17(3):471-7. Portuguese.

18. Ferreira GM, Correia LC. Reis H, Filho CB, Freitas F, Ferreira GM, et al. Maior letalidade e morbidade por infarto agudo do miocárdio em Hospital Público, em Feira de Santana - Bahia. Arq Bras Cardiol. 2009; 93(2):97-104.

19. Coelho LM, Resende ES. [Profile of patients with myocardial infarction in a university hospital]. Rev Med Minas Gerais. 2010; 20(3):323-8. Portuguese.

20. Solla DJ, Paiva Filho I de M, Delisie JE, Braga AA, Moura JB, Moraes Xd Jr, et al. [Integrated regional networks for ST-segment-elevation myocardial infarction care in developing countries: the experience of Salvador, Bahia, Brazil]. Circ Cardiovasc Qual Outcomes. 2013; 6(1): 9-17. Portuguese.

21. Mussi FC, Passos LCS, Menezes AA de, Caramelli B. Entraves no acesso à atenção médica: vivências de pessoas com infarto agudo do miocárdio. Rev Assoc Med Bras. 2007; 53(2):184-9.

22. Kushner FG, Hand M, Smith SC Jr, King SB 3rd, Anderson JL, Antman EM, Bailey SR, Bates ER, Blankenship JC, Casey DE Jr, Green LA, Hochman JS, Jacobs AK, Krumholz HM, Morrison DA, Ornato JP, Pearle DL, Peterson ED, Sloan MA, Whitlow PL, Williams DO. 2009 focused updates: ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction (updating the 2004 guideline and 2007 focused update) and ACC/AHA/SCAI guidelines on percutaneous coronary intervention (updating the 2005 guideline and 2007 focused update) a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol. 2009 ;54(23):2205-41.Review. Erratum in: J Am Coll Cardiol. 2009 Dec 15;54(25):2464. J Am Coll Cardiol. 2010 Feb 9;55(6):612. Dosage error in article text.