Hospital Admission and Hospital Death Associated to Ischemic Heart Diseases at the National Health System (SUS)

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Summary

Background: Analyses on mortality rate due to diseases when outcome depends on proper, timely medical intervention may point out the vulnerabilities and inequity associated to health care access. Ischemic heart diseases will act as models for such assessment.

Objective: The present study investigates factors associated to the hospital death rate of patients admitted to hospital due to acute myocardial infarction (AMI) and heart failure (HF), and whether admittance through Belo Horizonte Municipal Health Office (SMSA-BH) Admission Center (AC) was in any way associated to hospital death after adjustment of relevant factors.

Methods: Data obtained from the Hospital Admission Authorizations (AIH) and requests for hospital beds at SMSA data base on latest hospital admissions based on AMI or HF diagnostic hypotheses. Multivariate analysis was conducted to investigate risk factors for hospital death.

Results: No association was found between hospital admittance access and hospital death risk from those causes. Multivariate analysis showed higher death risk for 60 and 60+ year-old patients (OR=2.9), AMI diagnostic hypothesis (OR=3.0), the need for ICU care (OR=1.6), females (OR=1.4), surgery type (OR=1.9), and public health service hospital (OR=3.5). Hospital admissions due to AMI on weekends also showed higher death risk for death (OR=1.7).

Conclusion: Further investigation is necessary in order to evaluate the kind of medical assistance provided on weekends at public hospitals. Other hospital factors are to be taken into account, as well as patients and assistance procedures, as subsidies for proposals to ensure higher equity and quality standard for public health services. (Arq Bras Cardiol 2008; 90(2):119-126)

Key words: Myocardial ischemia/mortality; hospital mortality; equity in access; hospitalization.

Introduction

Mortality rate analyses due to diseases whose outcome depends on proper, timely medical intervention may point out the potential vulnerabilities in health care as well as access iniquities, thus indicating areas for further investigation[1]. Based on the magnitude and wide awareness on their etiology, pathophysiology, diagnosis, and treatment, ischemic heart diseases serve as good models for the present investigation.

Equity in good quality standard health care implies users' access to full, fast, and timely assistance to meet patients' needs, irrespective of personal or social and demographic data.

Health care services help in reducing health care iniquities while reducing the severity of medical conditions through good management, thus preventing populational health crises and deterioration, and consequently providing better living conditions[2].

The approach to health care services from the point of view of its structure, processing, and result may provide key information on service quality standard and act as a major contributor for improvement. The assessment of results mirror all health care contributions, those by patients included[3].

The Admission Centers (AC) were created as tools with the purpose to regulate access to hospital admission, to provide equitable, quality health care services by bridging the gap between existing demand and offer available for admission[4].

The SMSA – BH Admission Center intends to meet the demand in due time and through technically proper and resolutive services. Admissions are ranked following severity and complexity of conditions. Nonetheless, a significant number of hospital admissions is carried out directly by hospitals, without previous knowledge by the Admission Center. A study conducted in 2002 showed that not more than 24.9% of SUS-BH admissions with initial suspicion of acute myocardial infarction (AMI) and heart failure (HF) were

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done through the AC.

The purpose of the present paper is to investigate the factors associated to in-hospital deaths for SUS-BH admissions with initial diagnostic hypothesis having been acute myocardial infarction and heart failure in 2002, as well as to determine whether medical assistance outcome was AC-mediated after relevant factors adjustment.

Methods

Data Source -The following SMSA-BH 2002 data bases were used:

a) Hospital Admissions Authorizations - AIH (Departament of Information and Computer Services at SUS/Ministry of Health - DATASUS/MS).

b) Medical opinions to issue AIH and Requests for Hospital Beds sent to AC (PRODABEL — Empresa de Informática e Informação do Município de Belo Horizonte).

c) File with the number of medical opinions and AIH for file consolidation.

Medical opinion number is issued by AC on admission confirmation and is kept along the process up to invoicing. Admissions were evaluated up to final outcome, with data entered for death or survival at hospital discharge. Admission was considered AC-mediated whenever request date was on admission day or prior to admission. Otherwise, it was not considered AC-mediated and will be hereinafter referred to as direct admission.

Population and Study Timeframe - All hospital admissions in the period 2002-July 2003 were processed, since AIH may be entered for payment up to six months after patient discharge.

Study population was made up of both male and female patients who were 30 years old or older, with SUS-BH report of urgency or emergency in the period between January 1, 2002 and December 31, 2002. Diagnosis for AMI and HF were selected from medical opinions through procedures already mentioned. Codes were 77.500.024 and 77.500.032, respectively. Those are the procedures eligible for hospital admission based on initial diagnostic hypothesis. They will be referred to as "Diagnostic Hypothesis" (DH) hereinafter. No ICD 10 codes were used since those are filled out after diagnosis confirmation and treatment.

Every eligible patient was given a number in the data base. Whenever the same patient showed more than one hospital admission the latest one was to be considered. Therefore, every hospital admission under study corresponds to a different patient.

Patient follow-up was kept until discharge, death, or change in procedure due to a new diagnostic hypothesis - whatever happened first. Outcome variable was hospital death.

Exposure Variables - Exposure variables investigated were: gender (males and females); age range (median used as cut-off point: < 60, 60 years old or older); diagnostic hypothesis (AMI and Heart Failure); admission type (surgery and internal medicine); patient's home area (Belo Horizonte and other municipalities); admission day (weekend when admission date was Saturday or Sunday, and weekday any other day); hospital type (public and non-public); need for ICU during hospitalization (yes or no); admission process (AC or Direct). Variable response was classified as death or survival at discharge.

Statistical Analysis - Pearson's chi-square test and Fisher's exact test were used to evaluate different ratios among categorical variables. OR was calculated as power of association measure. Significance level was 0.05. Multiple logistic regression was used to investigate factors associated independently at death. Significance level for the addition of variables to the models was 0.20. Statistical significance for each variable in the model was evaluated by Wald's test. Models were construed for all patients admitted and for each mode of admission (AC or Direct) and each diagnostic hypothesis (AMI and HF).

The study was approved by SMSA-BH and by the Ethics and Research Committee at Minas Gerais State Federal University (UFMG).

Results

Univariate Analysis - Table 1 shows death to be more likely the outcome when patients were 60 years old or older (OR = 2.73); when diagnostic hypothesis was AMI (OR = 3.77); when patients needed ICU (OR = 2.25); and when admission was at a public hospital (OR = 3.82).

Table 2 shows that in-hospital death rate from hospital admissions was associated to female patients (OR = 2.12) who were 60 years old or older (OR = 3.12); BH residents (OR = 1.69); admissions on weekends (OR = 1.67) or at public hospitals (OR = 2.86) and through AC (OR = 0.60). As for hospital admissions due to HF, in-hospital death rate was associated to age range (60 or older) (OR = 2.73); surgery type (OR = 1.90); the need for ICU (OR = 3.55); and public hospitals (OR = 3.02).

Table 3 shows that in-hospital death from hospital admissions due to HF was associated to female patients (OR=2.40) who were 60 years old or older (OR=4.36); diagnostic hypothesis for AMI (OR=2.93). As for Direct Admissions in-hospital death rate was associated to age range (60 or older) (OR = 2.73); diagnostic hypothesis for AMI (OR = 4.21); the need for ICU (OR =2.44); and public hospitals (OR = 4.23).

Multivariate analysis - From all variables included in the analyses weekend admissions was the only one not to be included in the final model with all patients. Final model did keep hospital admissions due to AMI. Sixty-year old or older age range was kept in all models, as well as females admitted due to AMI through the AC. Public hospital admissions was not kept in the final model for admissions through AC. Diagnostic hypothesis was kept in both admission processes possibilities, with AMI reporting higher death risk. The need for intensive care was kept in the final model for both admission process possibilities (Table 4).

Discussion

Results have not shown any association between admission access process through AMI or HF diagnostic hypotheses and

Table 1 - Univariate Analysis of Deaths - SUS-BH - Patients following selected characteristics - 2002

Characteristics	Total n of patients (n=3,178)	Deaths (n= 190)	Lethality	OR	CI 95%
Gender					
Females	1,411	97 (51.1)	6.87	1.33	0.99 - 1.78
Males	1,767	93 (48.9)	5.26	1	
Age*					
60 and older	1,550	135 (71.1)	8.71	2.73	1.98 - 3.76
<60	1,627	55 (28.9)	3.38	1	
Diagnostic Hypothesys					
AMI	869	107 (56.3)	1.23	3.77	2.80 - 5.08
HF	2,309	83 (43.7)	3.59	1	
Speciality					
Surgery	285	22 (11.6)	7.72	1.36	0.86 - 2.15
Internal medicine	2,893	168 (88.4)	5.81	1	
Home address					
Belo Horizonte	1943	124 (65.3)	6.38	1.21	0.89 - 1.64
Others Municipalities	1,235	66 (34.7)	5.34	1	
ICU					
Yes	569	60 (31.6)	10.54	2.25	1.63 - 3.10
No	2,609	130 (68.4)	4.98	1	
Weekend					
Yes	617	47 (24.7)	7.62	1.39	0.99 - 1.96
No	2,561	143 (75.3)	5.58	1	
Public Hospital					
Yes	577	82 (43.3)	14.21	3.82	2.83 - 5.18
No	2601	108 (56.6)	4.15	1	
Admission moded					
Admission center	808	42 (22.1)	5.20	0.82	0.58 - 1.17
Directly	2730	148 (77.9)	6.24	1	

**1 age was ignored CI 95% - Confidence Interval; ICU - Intensive Care Unit; 95%; n - number of patients; OR - odds ratio; SUS-BH National Health System in Belo Horizonte.*

in-hospital death risk in the population under study. Both the analysis of factors associated to hospital death for each of the admission processes and the analysis of deaths in the study population as a whole have shown higher risk for patients in the 60-year-old or older range and when diagnostic hypothesis was AMI. Age range also increased the risk of death in hospital admissions due to the two diagnostic hypotheses. Age range magnitude was slightly more associated to AC hospitalizations when compared to those done directly. The opposite was observed for AMI.

Age has shown to be patient's severity indicator as well as a major death predictor, since a clear correlation between age range and the likelihood of death as the outcome[5] has been observed. Studies have shown higher hospital lethality among the elderly, especially when related to AMI[6-9]. A number of clinical manifestations in elderly patients differ from those reported by younger patients. Symptoms are less specific among the elderly: clinical presentation is commonly atypical, with high prevalence of asymptomatic or oligosymptomatic cases. The elderly also present a higher rate of comorbidities, which in their turn may complicate diagnostic and therapeutic intervention strategies and trigger side effects from drug administration[10-11]. A study conducted in the United States suggests that the elderly have lower probability of receiving therapies that are recommended by specific AMI guidelines when in the hospital setting, even after adjustments for hospital, physicians, and patients' characteristics[12].

Results have also shown that while analyzing the study population as a whole death risk from hospital admissions due to HF and AMI reported higher rate among female patients. Female patients have been associated to higher in-hospital or early post-hospital death rate from acute ischemic diseases, particularly AMI. Reasons-why have not been fully clarified. Some studies report women's advanced age as

Table 2 - Univariate Analysis of Death Rate - SUS-BH - patients admitted following diagnostic hypothesis - 2002

	Acute myocardial infarction					Heart failure				
Characteristics	Total (n=869)	Death (n= 107)	Lethality	OR	CI 95%	Total (n=2,309)	Death (n= 83)	Lethality	OR	CI 95%
Gender										
Femalesr	316	56 (52.3)	17.72	2.12	1.41 - 3.19	1,095	41 (49.4)	3.74	1.09	0.70 - 1.68
Males	553	51 (47.7)	9.22			1,214	42 (50.6)	3.46		
Age *										
60 and older	402	75 (70.1)	18.66	3.12	2.01 - 4.83	1,148	60 (72.3)	5.23	2.73	1.67 - 4.44
<60	467	32 (29.9)	6.85			1,160	23 (27.7)	1.98		
Type										
Surgery	56	8 (7.5)	14.29	1.20	0.55 - 2.62	229	14 (16.9)	6.11	1.90	1.05 - 3.43
Internal Medicine	813	99 (92.5)	12.18			2,080	69 (83.1)	3.32		
Home residence										
Belo Horizonte	518	75 (70.1))	14.48	1.69	1.09 - 2.62	1,425	49 (59.0)	3.44	0.89	0.57 - 1.39
Other Municipalities	351	32 (29.9)	9.12			884	34 (41.0)	3.85		
ICU										
Yes	303	35 (32.7)	11.55	0.90	0.58 - 1.38	266	25 (30.1)	9.40	3.55	2.18 - 5.78
No	566	72 (67.3)	12.72			2,043	58 (69.9)	2.84		
Weekend										
Yes	207	35 (32.7)	16.91	1.67	1.08 - 2.58	410	12 (14.5)	2.93	0.78	0.42 - 1.45
No	662	72 (67.3)	10.88			1,899	71 (85.5)	3.74		
Hospital público										
Yes	274	57 (53.3)	20.80	2.86	1.90 - 4.32	303	25 (30.1)	8.25	3.02	1.86 - 4.91
No	595	50 (46.7)	8.40			2,006	58 (69.9)	2.89		
Admission Mode										
Admission Center I	281	25 (23.4)	8.90	0.60	0.38 - 0.97	527	17 (20.5)	3.23	0.87	0.50 - 1.49
Directly	588	82 (76.6)	13.95			1,782	66 (79.5)	3.70		

**1 age was ignored. CI 95% - Confidence Interval; ICU - Intensive Care Unit; 95%; n - number of patients; OR - odds ratio; SUS-BH National Health System in Belo Horizonte.*

well as a higher number of comorbidities and complications while at hospital as reasons-why - at least partially - for the differences found. In the present study, age was included in the analysis, while gender was kept as an independent factor in consistence with studies elsewhere with findings that higher death risk in female patients – even after age adjustments and clinical data, among others – was shown to be associated to the assistance provided[7-8,13-15].

The possible explanation for mortality rate differences between males and female patients was investigated in a number of studies. An English study investigated whether females with AMI were given the same opportunity as men to receive therapeutic interventions. The study showed that females took more time to reach the hospital after the onset of symptoms, were more likely to present more severe condition at admission, and were less likely to be admitted at Coronary Units for thrombolytic treatment[16]. Females with AMI were also less likely to be submitted to invasive cardiac procedures in the United States[17].

Such data may be translating – at least partially – gender inequality in regard to health care and access given to male and female patients. Health care equitable service pressuposes the elimination of unnecessary, avoidable, and unfair disparities between male and female patients, all associated to systematic disadvantages in health care and assistance access[18].

From the study population as a whole, death risk showed to be higher among patients admitted directly, among those admitted due to HF, and those who needed intensive care, which possibly indicates more severe conditions. It was also observed, however, that not all patients stayed at the ICU. As cases were screened based on initial suspicion rather than on confirmed diagnosis, in addition to the difficulty in finding

Table 3 - Univariate Analysis of Deaths – SUS-BH - patients following admission modes - 2002

Characteristics	Admission Center					Direct Admission				
	Total n of patients (n=808)	Deaths (n= 42)	OR	CI 95%	Lethality	Total n of patients (n=2,370)	Death (n= 148)	Lethality	OR	CI 95%
Gender										
Females	335	26 (61.9)	2.4	1.27 - 4.56	7.76	1,076	71 (48.0)	6.60	1.12	0.80 - 1.56
Males	473	16 (38.1)	1		3.38	1,294	77 (52.0)	5.95	1	
Age*										
60 and older	383	33 (78.6)	4.36	2.06 - 9.23	8.62	1,167	102 (68.9)	8.74	2.41	1.68 - 3.44
<60	425	9 (21.4)	1		2.12	1,202	46 (3.1)	3.83	1	
Diagnostic Hypothesis										
AMI	281	25 (59.5)	2.93	1.55 - 5.52	8.90	588	82 (55.4)	13.95	4.21	3.00 - 5.91
HF	527	17 (40.5)	1		3.23	1,782	66 (44.6)	3.70	1	
Speciality										
Surgery	45	2 (4.8)	0.84	0.20 - 3.60	4.44	240	20 (13.5)	8.33	1.42	0.87 - 2.32
Internal Medicine	763	40 (95.2)	1		5.24	2,130	128 (86.5)	6.01	1	
Home Address										
Belo Horizonte	451	27 (64.3)	1.45	0.76 - 2.78	5.99	1,492	97 (65.5)	6.50	1.13	0.80 - 1.60
Other Municipalities	357	15 (37.5)	1		4.20	878	51 (34.5)	5.81	1	
ICU										
Yes	156	12 (28.6)	1.72	0.86 - 3.46	7.69	413	48 (32.4)	11.62	2.44	1.70 - 3.51
No	652	30 (71.4)	1		4.60	1,957	100 (67.6)	5.11	1	
Wekeend										
Yes	136	11 (26.2)	1.82	0.89 - 3.72	8.09	481	36 (24.3)	7.48	1.28	0.87 - 1.90
No	672	31 (73.8)	1		4.61	1,889	112 (75.7)	5.93	1	
Public Hospital										
Yes	25	3 (7.1)	2.60	0.75 - 9.10	12.00	552	79 (53.4)	14.31	4.23	3.02 - 5.94
No	783	39 (92.9)	1		4.98	1,818	69 (46.6)	3.80	1	

**1 age was ignored CI 95% - Confidence Interval; ICU - Intensive Care Unit; 95%; n - number of patients; OR - odds ratio; SUS-BH National Health System in Belo Horizonte.*

hospital beds for all cases, this group – diagnostic group – also included patients reporting non-cardiac chest pain.

Public hospitals seem to be persistently associated to higher death risk for the study population through direct admissions and for patients admitted with AMI and HF. Such finding is controversial when compared to a study conducted in Ribeirão Preto, São Paulo State, which showed better clinical performance – measured by adjusted hospital mortality rate – at public hospitals when compared to private hospitals[19].

Contributing factors for hospital mortality rate variation may be grouped into three categories: patients' characteristics, hospital organizational characteristics, and community setting. Results differences between hospitals may be due to the profile of patients under treatment, severity and complexity of cases, demographics, associated pathologies, social and economic differences, health care attitude and technology available at the different services. Adjustments must be made to contemplate those characteristics for performance comparison to be valid[20-23].

One limitation posed by the present study was that the adjustment to consider other factors influencing hospital lethality rate due to the conditions under study was not possible, therefore limiting the interpretation of results. Unfortunately, clinical data details are not available in the data base for patient's comorbidities, or surgical, therapeutic and diagnostic procedures at admission. Data included in a detailed secondary diagnosis form would be of help for the adjustment, following condition severity.

A Belo Horizonte study identified variable admission at SUS as a predictor for serious pre-operative events and hospital death

Table 4 - Final logistic models for total number of deaths – patients admitted due to ischemic heart diseases per diagnostic hypothesis and admission mode through SUS-BH - 2002

Variables	Coeficient	Standard error	p	OR	CI 95%
Total Deaths					
Age: 60 and older	1.065	0.171	0.000	2.902	2.076 - 4.056
Diagnostic hypothesis - AMI	1.108	0.167	0.000	3.028	2.182 - 4.202
ICU	0.484	0.179	0.007	1.622	1.142 - 2.304
Public hospital	1.273	0.170	0.000	3.573	2.560 - 4.986
Female patients	0.372	0.158	0.019	1.451	1.064 - 1.977
Surgery speciality	0.691	0.257	0.007	1.996	1.207 - 3.300
Constant	-4.568	0.203	0.000	0.010	
Admission Center					
Age: 60 and older	1.485	0.389	0.000	4.415	2.061 - 9.458
Diagnostic hypothesis - AMI	1.319	0.336	0.000	3.739	1.937 - 7.218
Female Patients	0.981	0.339	0.004	2.668	1.373 - 5.184
Constant	-4.949	0.454	0.000	0.007	
D					
Age: 60 and older	1.003	0.190	0.000	2.725	1.879 - 3.953
Diagnostic Hypothesis - AMI	1.022	0.190	0.000	2.778	1.914 - 4.032
Public hospital	1.212	0.185	0.000	3.359	2.336 - 4.828
ICU	0.659	0.200	0.001	1.933	1.306 - 2.862
Constant	-4.286	0.206	0.000	0.014	
Acute myocardial infarction					
Famale patients	0.591	0.218	0.007	1.807	1.178 - 2.771
60 years old and older	1.179	0.233	0.000	3.250	2.058 - 5.133
Public hospital	1.147	0.218	0.000	3.150	2.053 - 4.832
Weekend	0.535	0.236	0.023	1.708	1.076 - 2.710
Constant	-3.502	0.258	0.000	0.030	
Acute heart failure					
Age: 60 and older	1.021	0.252	0.000	2.777	1.695 - 4.549
Public hospital	1.168	0.253	0.000	3.217	1.958 - 5.285
ICU	1.338	0.254	0.000	3.812	2.316 - 6.274
Constant	-4.410	0.241	0.000	0.012	

AMI - Acute Myocardial Infarction; CI 95% - Confidence Interval 95%; ICU - Intensive Care Unit; n - number of patients; OR - odds ratio; SUS-BH (National Health System in Belo Horizonte).

rate during myocardial revascularization surgery. The study showed higher death risk among patients admitted through SUS in pre-surgery and immediate post-operative period (on surgery day) with patients' clinical condition severity well characterized by pre-operative cardiogenic shock. The authors suggest that the findings may reveal SUS patients' difficulties in having access to medical assistance, diagnosis and proper treatment, in addition to their poorer social and economic status[24].

In regard to health system structure, data available revealed high need of hospital beds for cardiology services at SUS-BH at the time of the study. DATASUS data (information obtained through GEINFS - Gerência de Sistema de Infra-estrutura, SUS, DATASUS/SM, 2005), 302 hospital beds at cardiology services were available in 2003. Out of those, 81.3% were available to SUS patients. ICU beds totaled 251, with 50.6% of them available to SUS patients. From all hospital beds available to SUS cardiology patients at 14 different hospitals only 3.6% belonged to public hospitals, and were concentrated at two services. The availability for ICU beds was 51.2%. Three public hospitals had open access to emergency outpatient assistance, which increased the number of admissions without the counterpart of more hospital beds availability, which may have led to delayed access to proper treatment. No reliable information was available on the access to hemodynamic and surgery services

at the time of the study. Such data would contribute to better characterize assistance following diagnostic and therapeutic resources at those hospitals.

Additionally, many studies have shown that high volumes of some surgical conditions and procedures are associated to better results. However, the magnitude of such correlation varies greatly[25-32]. Although the causal mechanism of such correlation has not yet been fully clarified, some authors have suggested that the hospitals with higher volumes were bound to count on more experienced health care teams and surgery specialists who could provide more effective assistance to a higher number of cases. Those services might also have been better equipped, have counted on consistent processes and resources to manage post-operative care and associated complications. They might also have counted on better equipped ICU[31-32]. Thiemann et al[26] found better results for elderly patients with AMI when they were admitted directly at hospitals treating high numbers of coronary syndrome patients as compared to those with a small number of patients. He suggested the availability of an experienced health care team was a key factor for AMI outcome[26].

Public hospitals as a whole show their admission to be 4.5 times lower than all the other hospitals, although no comparison between them for volume classes was available. Although the issue of whether high volume hospitals provide better results because practice leads to improved performance or whether better results hospitals have higher volumes because their expertise is recognized, those data may mirror delayed access to hospital admission and difficulties posed by health care assistance process, as well as by diagnostic and therapeutic support, and health care team professional skills.

However, those results point towards the need for further investigation on the assistance provided by those services, to verify whether the results found are due to public hospitals structure, to health care team skills, to patients' characteristics, or to the type of health care provided.

Another aspect to be pointed out is the higher risk presented by patients admitted on weekends when diagnostic hypothesis was AMI, having in mind the wide awareness on AMI etiology, pathophysiology, epidemiology, treatment, and risk factors in addition to the availability and the effectiveness of medical and hospital technology.

Some investigations have suggested worse results for patients admitted on weekends when compared to patients admitted on week days, although such variation has not been well established. A Canadian study analyzing acute admissions at emergency services found that patients reporting certain severe conditions were more prone to death as outcome if admitted on weekends as compared to week days, although the difference was not statistically significant for AMI cases[33]. Another study revealed that variations in hospital mortality rate may be explained by the extreme overload at ICU and could mirror the inappropriate number of doctors and nurses in the team, or even problems in training, supervision, or equipment[34]. Patients admitted on weekends also reported slightly higher risk of death and time at the ICU at 38 hospitals in Ohio State, in the United States, in the time period between 1991 and 1997[35].

Considering the real life scenario of emergency units in Belo Horizonte[36] – as well as in the country as a whole – the hypothesis for results found in the present paper is that it shows – at least partially – the lack of assistance for admissions on weekends. The highest assistance demand on weekends is associated to a possible lack of diagnostic and human resources available, in particular of specialized health care teams, may explain the results obtained in the present paper. AMI, as any other acute condition, requires proper diagnosis and management, as well as well trained teams every day of the week. Those results must be investigated in further details to identify higher risk hospitals and possible causes. Systematic analysis of the AIH will allow monitoring interventions results and therefore aim at eliminating possible discrepancies in the outcome of health care assistance provided on weekends.

In regard to the data base under analysis, possible errors are not to be ruled out, particularly associated to diagnosis, since data have been collected for administration purposes. However, doctors at SMSA-BH Hospital Supervision conduct systematic review on admissions: type, assistance provided, information on initial diagnostic hypothesis, diagnostic confirmation, and hospital invoicing before sending to SMSA-BH central office for consolidation in order to minimize errors and biases. Studies elsewhere have also pointed out data base improvement and reliability for variables regarding admissions and patients' characteristics[6,37-39].

Conclusion

It is possible that different populational groups have been screened in regard to their social, demographic and risk profile for the different modes of admissions. Data available do not allow any conclusion in that regard. Despite potential limitations, the present study has identified differences regarding in-hospital lethality rate in the population studied in 2002, with higher risk for patients admitted due to AMI, for advanced age patients, and for female patients for AMI and HF admissions, which may suggest possible disparities in health care access. Further studies are required to clarify the present findings, as well as the correlation between lethality rate from AMI and weekend admissions associated to poorer performance at public hospitals. Discrepancies observed in health care access and medical assistance not only identify existing problems but also serve as subsidy for interventions that may contribute for higher quality and equity in health care services.

Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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