

Acute myocardial infarction patients in outpatient clinics and emergency rooms receive different treatment modalities.

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Abstract

Aim: To look into pertinent factors and patients who had been admitted with acute myocardial infarction (AMI) during the week and on the weekends. **Method:** Retrospective population-based study from 2021 to 2022 among patients with the first AMI total of 1500, the weekday group of 987, and the weekend group of 513, with no statistically significant differences in the other variables such as emergency, hospital level, hospital ownership, and urban-rural gap. In addition, this study analyzed these samples by identifying outcome differences between those admitted on weekdays and weekends after they received tissue plasminogen activator (TPA) treatment, percutaneous transluminal coronary angioplasty (PTCA), or a coronary artery bypass graft (CABG). No significant difference in average hospitalization fees or average length of stay was observed between weekdays and weekends. A significant difference in admission was observed between the weekday and weekend samples ($P<.001$). In conclusion, expanding the use of EMS for patients with suspected MI in the current era of acute reperfusion may present a significant opportunity for public health advancement.

Keywords: acute myocardial infarction, the weekend effect, hospitalization

Introduction:

Myocardial infarction (MI) is the single largest killer of men and women in the United States, resulting in more than 475 000 deaths each year. More than half of people who have a fatal MI pass away without receiving medical care within the first hour [1,2].

Early application of acute reperfusion therapies in the care of patients with ST-elevation MI has been shown to improve outcomes [3,4]. Some experts have suggested that greater utilization of EMS may lead to faster administration of fibrinolytic therapy, although this has not been proven conclusively. Treatment that was delayed resulted in death (mortality rate of 80%). So, for patients with AMI, prompt hospital admission and care are essential to ensuring a good outcome.

It is important to note that the following information is for informational purposes only and is not intended to be used for any other purpose. In this study, the health status of patients with AMI who were admitted on weekdays or weekends using a variety of admission procedures and who underwent a range of medical procedures in hospitals located in various locations and at various levels was examined.

This study compared the prognosis and medical outcomes of AMI patients admitted on weekdays and weekends, and it looked into the impact of hospital levels and the rural-urban development gap on these differences.

Method:

With the exception of patients who were younger than 18 years old, had no preference for sex, or had their first episode of AMI (ICD-9 410.x1) outside of an inpatient setting, this study examined samples of patients who had their first episode of AMI (ICD-9 410.x1) in 2021 to 2022. In addition, this study analyzed these samples by identifying outcome differences between those admitted on weekdays and weekends after they received tissue plasminogen activator (TPA) treatment, percutaneous transluminal coronary angioplasty (PTCA), or a coronary artery bypass graft (CABG) (CABG). This study divided hospital emergency admission into two periods: weekends: Saturdays, Sundays, and holidays, including national holidays, festival days, memorial days, and deferred holidays; weekdays: days other than weekends and holidays. The patients were followed up until withdrawal from the NHI or death. The present study has been exempted from review by the Institutional Review Board. Admission type (emergency or outpatient): An emergency admission was defined as a medical admission that resulted in hospitalization fees for additional observation in the ED or emergency diagnostic fees.

The chi-squared test and independent sample t test were used in this study's univariate correlation analysis along with SAS version 9.3 for statistical analysis. ($P < .05$).

Results:

Table 1: The baseline characteristics of acute myocardial infarction patients admitted between weekdays and weekend

Variables	Weekday (n=987)		Weekend (n=513)		Total (n=1500)		P value for χ^2 -test
	N	%	n	%	N	%	
Sex							
Men	552	65.05	355	69.45	907	65.26	.745
Women	435	34.95	158	30.55	593	34.74	
Age, yrs							
<45	40	5.00	12	2.50	52	2.94	.175
45–65	321	30.00	141	25.00	462	28.95	
>65	626	65.90	360	72.50	986	68.11	
Mean \pm SD	65.5 \pm 10.0		60.5 \pm 11.5		65.5 \pm 11.6		
Admission							
Emergency department	370	34.27	300	55.60	670	40.00	<.001
Outpatient clinics	617	65.73	213	44.40	830	60.00	

A significant difference of admission was observed between the weekday and weekend samples ($P < .001$).

Table 2: The treatment distribution of acute myocardial infarction patients between weekdays and weekend.

	Weekday			Weekend			Total			
	OPD	ER	Sub-total	OPD	ER	Sub-total	OPD	ER	Sub-total	
A: TPA	10	15	25	10	13	23	20	28	48	.007
B: PTCA	532	410	942	205	225	430	737	635	1372	.856
C: CABG	145	110	255	40	65	105	185	175	360	.545
Sub-total	687	537	1224	255	303	558	942	840	1782	
B+C	40	43	83	15	25	40	55	68	123	.031
Others*	5	3	8	2	5	7	7	8	15	.149
Cost of TPA	2.80±1.50 (ten thousand)			3.36±0.90 (ten thousand)			3.10±1.05 (ten thousand)			
Cost of PTCA	6.73±3.40 (ten thousand)			6.59±3.31 (ten thousand)			6.79±3.35 (ten thousand)			
Cost of CABG	44.90±25.45 (ten thousand)			43.12±22.55 (ten thousand)			45.55±25.02 (ten thousand)			
Days of hospitalizations	7.0±9.1			7.5±9.4			7.2±9.1			

No significant difference in average hospitalization fees or average length of stay was observed between weekdays and weekends.

Discussion:

Income, insurance, aspirin use, admission timing (weekdays or weekends), hospital ownership, ED traffic, the number of cardiologists on staff, their level of pPCI experience, and the door to balloon (D2B) time were all related to the mortality risk of patients who underwent pPCI [5,6,7]. Therefore, a high-quality cardiology center outfitted with a strong network connecting each department or division, thorough medical treatment planning, and skilled attending physicians can guarantee no appreciable differences in mortality risk and offer patients effective pPCI treatments regardless of admission time.

Each year, more than 20% of the patients received CABG treatment, whereas 6.8% of the patients received pPCI followed by CABG (indicating riskier treatment conditions or higher disease severity). Mehta et al. (2013) discovered that patients with ST-segment elevation myocardial infarction who underwent pPCI with stent implantation ultimately required CABG due to stenosis recurrence and vessel malformation or rupture, with mortality rates of 10% and 20%, respectively. Monitoring TIMI 3 flow rate is a safe option for patients who need early CABG to enable timely treatment of early ischemia. [8,9]

Additionally, despite the fact that there were significantly more male patients than female patients and that male patients experienced an AMI incidence rate that was 2.15 times higher than that of female patients, no discernible differences in mortality rates between the sexes were found in a modeling analysis [10].

Finally, this study did not include various variables not provided in the NHIRD, such as times (eg, working and nonworking hours, D2B time, and referral time), disease severity, number and quality of medical professionals on duty, physician service length and experience, ED service volume, ED overcrowding status, and cardiac catheterization room status, leading to possible bias in the analysis results.

Conclusion:

Our findings independently support those of other studies that have found EMS to be underutilized during MI, and they also support EMS's bigger role in the overall management of

patients with cardiac symptoms. In the current era of acute reperfusion, expanding the use of EMS for patients with suspected MI may present a significant potential for public health advancement.

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