ORIGINAL ARTICLE

Investigating the Complications and Consequences of Myocardial Infarction between Abusers and Non-abusers of Opiate: A Cross-sectional Study in the South of Iran

MOJTABA FARJAM[1], AZIZALAH DEHGHAN[2]. MOSTAFA BIJANI[3]*, SOHA SALIMI[4], EHSSAN BAHRAMALI[5], ABDOLHAKIM ALKAMEL[6]

[1]Non Communicable Diseases Research Center (NCDRC), Fasa University of Medical Sciences, Fasa, Iran.
[2]Non Communicable Diseases Research Center (NCDRC), Fasa University of Medical Sciences, Fasa, Iran.
[3]Department of Medical Surgical Nursing, Fasa University of Medical Sciences, Fasa, Iran.
[4]Student research committee, Fasa University of Medical Sciences. Fasa, Iran.
[5]Non Communicable Diseases Research Center (NCDRC), Fasa University of Medical Sciences, Fasa, Iran.
[6]Non Communicable Diseases Research Center (NCDRC), Fasa University of Medical Sciences, Fasa, Iran.

Abstract

Background: One of the major risk factors in cardiovascular diseases is Opiate abuse. Accordingly, the present study aims to investigate the complications and consequences of myocardial infarction between Abusers and Non-abusers of Opiate in the south of Iran

Methods: The present study is a cross-sectional work of research. 1800 myocardial infarction (MI) patients at Fasa Registry on Acute Myocardial Infarction (FaRMI) were selected for study. Data were collected from 2015 to 2020. The collected data were analyzed in SPSS v. 22 using the statistical tests of independent t-test and chi-square. Significance level was set at $p<0.05$.

Results: Out of the 1800 patients, 593 (32.9%) were female and 1207 (67.1%) were male. The rate of Opiate abuse in the study population was found to be 25.6. The results showed a significant relationship between the Opiate patients' average age and gender on the one hand and Opiate abuse on the other ($p<0.001$). Also, Opiate abuse was found to significantly correlate with hypertension, diabetes, and hyperlipidemia as risk factors in AMI ($p<0.001$).

Conclusion: Given the prevalence of Opiate abuse and its role in cardiovascular diseases, especially AMI , in the present study, it is recommended that the senior administrators in the healthcare system take effective measures to raise public awareness about the potential harms of Opiate abuse.

Keywords: Opiate Abuse, Myocardial Infarction, Cardiovascular Diseases, Iran.

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INTRODUCTION

Among the major causes of death all over the world, cardiovascular diseases have posed healthcare systems with a variety of challenges, including an increase in the rate of hospitalization and high medical expenses [1]. According to WHO, 50% of the mortality rate in developed countries and 30% of the mortality rate in developing countries are due to coronary artery diseases (CAD) [2]. The American Heart Association reports that 35% of the deaths in the world are caused by cardiovascular diseases [3]. The results of studies in Iran show that the first and most common cause of death among patients is cardiovascular diseases, especially cardiac arrest—over 40% of the mortality rate in Iran is owing to cardiac arrest and related consequences [4-5]. A variety of factors can lead to cardiovascular diseases, one of the most significant of which is drug abuse. According to WHO, drug abuse is a major contributory and aggravating factor in most diseases, especially chronic, non-infectious diseases, including cardiovascular diseases, respiratory diseases, cancer, and stroke [6]. The results of a review study conducted by Ziaee et al. (2019) show that opium abuse can, in the long-term, lead to changes in plasma fibrinogen levels, coagulation, atherosclerosis, and cause or aggravate coronary artery diseases (CAD), hypertension, cardiac arrest, and stroke [7]. Although the abuse of opium has significantly decreased in many societies, developing countries, including Iran, have seen a sharp rise in drug abuse [8]. The results of a study in Iran show that 38.3% of patients hospitalized due to cardiac arrest or a coronary artery disease are addicted to opium [9]. In addition, according to the study of Khalili et al. (2021), 46.19% of men and 4.27% of women in Iran abuse opiate drugs at least once every six months [10].

Few studies have comprehensively addressed the relationship between Opiate abuse and the complications and consequences of MI in the cultural context of Iran.

*Correspondence to: Mostafa Bijani, Ph.D, Assistant Professor, Department of Medical Surgical Nursing, Fasa University of Medical Sciences, Fasa, Iran. Postal code: 81936-13119.
Tel: +98 9173308451, Email: bizhani_mostafa@yahoo.com

Accordingly, the present study was conducted to investigating the complications and consequences of MI between Abusers and Non-abusers of Opiate in the south of Iran from 2015 to 2020.

METHODS

The present study is a case-control work of research. Selected through complete enumeration, 1800 cardiac arrest patients from FaRMI were included in the study. FaRMI is the first population-based registry for AMI in Iran targeted to provide meticulous description of patients' characteristics, explore their management patterns, discover the degree of adherence to the practice guidelines, and investigate the determinants of poor in-hospital and later outcomes. FaRMI is credited with the first approved national MI registry system in the ministry of health (MOH) center for registries. For the first time in Iran, it will enable documentation of the long-term (5 years) outcomes of patients presenting with AMI in 2020. [11].

Data were collected from 2015 to 2020. The subjects were selected according to consensus sampling technique. Accordingly, a total number of 1800 participants aged 30 years old or above were recognized as eligible and then invited to participate in this study . The exclusion criteria were inability to answer the items on the questionnaire due to emotional issues, Alzheimer's disease, or psychological disorders. In the present study, the patients were divided into three groups: Opiate addicts, non-addicts, and former Opiate addicts.

To collect data, the researchers used a questionnaire based on FaRMI. The questionnaire included items on demographic characteristics, degree and method of Opiate abuse, smoking cigarettes and hookahs, hypertension, hyperlipidemia, and diabetes. The researchers also recorded the MI patients' length of stay, its symptoms, type of cardiac arrhythmia, type of treatment, extent and location of MI, and rate of hospital mortality. The collected data were analyzed in SPSS v. 22 using the statistical tests of independent t-test and chi-square. P-values of smaller than 0.05were considered to be statistically significant.

Ethical Considerations

All the participants gave written informed consent to participate in the study. The present study was conducted in terms of the principles of the revised Declaration of Helsinki, which is a statement of ethical principles that directs physicians and other participants in medical research involving human subjects. The participants were assured about their anonymity and the confidentiality of their information. Moreover, the study was approved by the Institutional Research Ethics Committee of Fasa University of Medical Sciences, Fasa, Iran (code: IR.FUMS.REC.1398.062).

RESULTS

Out of the 1800 patients, 593 (32.9%) were female and 1207 (67.1%) were male. The patients' average age was 63.3±13.36 years. The results showed a significant relationship between the participants' average age, gender, and place of residence on the one hand and Opiate abuse on the other (p<0.001). Opiate was found to be the most commonly used drug in the study population (23.9%) (Table1).

Table 1. Status of Opiate abuse, type of drug, and rate of abuse

Variable		Frequency	Percentage
Opiate abuse status	Abuser	460	25.6
	Former abuser	55	3.1
	Non-abuser	1192	66.2
Type of Opiate	Heroin	2	0.1
	Methadone	19	1.1
	Opium residue	41	2.3
	Opium	436	24.2
	Other	28	1.6
Rate of Opiate abuse	Less than once a week	26	1.4
	1 to 4 times a week	19	1.1
	5 to 9 times a week	123	6.8
	10 to 14 times a week	200	11.1
	Over 14 times a week	129	7.2

Moreover, the results showed that there was a significant relationship between smoking cigarettes and hookahs on the one hand and drug abuse on the other (Table 2).

Likewise, the results showed that there was a significant relationship between hypertension, diabetes, and hyperlipidemia as cardiac arrest risk factors on the one hand and drug abuse on the other (p<0.001) (Table 3).

Table 2. The relationship between opium abuse and smoking cigarettes and hookahs

Variable		Drug Abuser	Former drug abuser	Non-abuser	P-value
Smoking cigarettes	Smoker	288 (62.6%)	30 (54.5%)	193 (16.2%)	<0.001
	Former smoker	32 (7%)	16 (29.1%)	78 (6.5%)	
	Non-smoker	140 (30.4%)	9 (16.4%)	921 (77.3%)	
Smoking hookahs	Smoker	14 (3.1%)	4 (7.3%)	28 (2.4%)	<0.001
	Former smoker	6 (1.3%)	3 (5.5%)	13 (1.1%)	
	Non-smoker	438 (95.6%)	48 (87.3%)	1140 (96.5%)	

The most common symptoms of MI were found to be angina and dyspnea. Also, the results showed a significant relationship between the patients' history of drug abuse and their back pains and cold sweats (Table 4).

Based on the findings of the study, there was not a significant relationship between the location of cardiac arrest, type of arrest and administered treatment, mortality rate during hospital stay, mortality rate in one year. The other factors are shown in Table 5.

Table 3. The relationship between Opium abuse and myocardial infarction risk factors

Variable		Abuser	Former abuser	Non-abuser	P-value
BMI (Mean±SD)		23.06±7.35	23.90±7.47	23.06±7.21	0.761
Waist size (Mean±SD)		75.35±34.37	74.94±35.46	77.24±33.24	0.615
Hypertension	Yes	163 (35.3%)	18 (32.7%)	626 (52.5%)	<0.001
	No	296 (64.5%)	37 (67.3%)	566 (47.5%)	
Hyperlipidemia	Yes	94 (20.5%)	15 (27.3%)	377 (31.7%)	<0.001
	No	365 (79.5%)	40 (72.7%)	814 (68.3%)	
Diabetes	Yes	74 (16.1%)	11 (20%)	339 (28.4%)	<0.001
	No	385 (83.9%)	44 (80%)	853 (71.6%)	

Table 4. The relationship between drug abuse and symptoms of myocardial infarction

Variable	Abuser	Former abuser	Non-abuser	P-value
Angina	389 (84.6%)	46 (83.6%)	994 (83.4%)	0.84
Dyspnea	173 (37.6%)	23 (41.8%)	424 (35.6%)	0.51
Sweating	115 (25%)	21 (38.2%)	331 (27.8%)	0.09
Syncope	5 (1.1%)	0 (0%)	15 (1.3%)	0.68
No symptoms	1 (0.2%)	0 (0%)	1 (0.1%)	0.75
Back pain	62 (13.5%)	5 (9.1%)	225 (18.9%)	0.009
Jaw pain	28 (6.1%)	2 (3.6%)	75 (6.3%)	0.72
Shoulder pain	138 (30%)	20 (36.4%)	373 (31.3%)	0.60
Epigastric pain	87 (18.9%)	10 (18.2%)	195 (16.4%)	0.45
Cold sweats	268 (58.3%)	40 (72.7%)	598 (50.2%)	<0.001
Others	49 (10.7%)	4 (7.3%)	108 (9.1%)	0.52

Table 5. The relationship between drug abuse and the location, type, and treatment of cardiac arrest and other factors

Variable	Abuser	Former abuser	Non-abuser	P-value
Ant. MI	147 (32%)	19 (34.5%)	382 (32%)	0.92
Inf. MI	143 (31.1%)	21 (38.2%)	310 (26%)	0.02
Lat. MI	23 (5%)	5 (9.1%)	99 (8.3%)	0.06
Post. MI	22(4.8%)	1 (1.1%)	42 (3.5%)	0.35
NSTEMI	156 (33.9%)	16 (29.1%)	457 (38.3%)	0.11
RV MI	4 (0.9%)	1 (1.8%)	28 (2.3%)	0.14
STEMI	305 (70.1%)	38 (77.6%)	722 (65.4%)	0.27
NSTEMI	130 (29.9%)	11 (22.4%)	382 (34.6%)	0.37
SK	35 (13.9%)	8 (27.6%)	88 (15.5%)	0.15
RtPA	89 (35.6%)	6 (20.7%)	172 (30.5%)	0.17

Table 5. Continued

Variable	Abuser	Former abuser	Non-abuser	P-value
Primary PTCA	127 (50.6%)	15 (51.7%)	296 (52.2%)	0.91
Rescue PCI	23 (9.2%)	2 (6.9%)	27 (4.8%)	0.05
Urgent CABG	2 (0.8%)	0 (0%)	1 (0.2%)	0.35
Supraventricular arrhythmias	4 (100%)	44	36 (81.8%)	0.22
Ventricular arrhythmias	11 (20%)	1179	90 (7.6%)	p<0.001
Mortality during hospitalization	17 (3.7%)	1 (1.8%)	50 (4.2%)	0.63
Annual mortality	11 (6.8%)	0 (0%)	22 (6.2%)	0.61

*Ant.MI: Anterior wall Myocardial Infarction. Inf. MI: Inferior wall Myocardial Infarction. Lat. MI: Lateral wall Myocardial Infarction. Post. MI:Posterior wall Myocardial Infarction. NSTEMI: Non-ST-elevation myocardial infarction. STEMI: ST-elevation myocardial infarction. RV MI: Right Ventricular Infarction. SK: Streptokinase. RtPA: Reteplase. Primary PTCA: Primary Percutaneous transluminal coronary angioplasty. Rescue PCI: Rescue percutaneous coronary intervention. CABG: Coronary Artery Bypass Graftin

DISCUSSION

Identifying and examining the risk factors in cardiovascular diseases, including cardiac arrest, play a significant part in preventing and taking effective measures toward eliminating these factors [12]. In the current study, the rate of Opiate abuse was found to be 25.6%, with opium being the most commonly abused drug. Also, 62% of the subjects smoked cigarettes in addition to abusing Opiate. Considering the prevalence of smoking and opium abuse as major risk factors in cardiovascular diseases, cardiac arrest, stroke, and cancer, healthcare administrators and policy-makers are required to devise plans to prevent and eliminate these risk factors. According to the American Heart Association, Opiate abuse and smoking are major modifiable risk factors in cardiovascular diseases and healthcare policy-makers should take measures to control addiction to smoking and opium and develop comprehensive plans to raise public health awareness and promote self-care behaviors [13].

The findings of this study show that there is a significant relationship between MI on the one hand and age, gender, and opium abuse on the other, which is consistent with the results of the study of Harati et al [14]. The results of the present study also show that there is a significant relationship between Opiate abuses on the one hand and hypertension, cardiac arrest, and diabetes on the other. Similarly, Nakhaee et al. (2020) and Adib et al. (2020) report that Opiate abuse directly correlates with hypertension and cardiac arrest and, thus, opium abusers are more prone to cardiac arrest and hypertension. They also report that the relationship between Opiate abuse and mortality rate during hospital stay is not significant, which is in tune with the findings of the present study [15-16]. However, according to the studies of Masoudkabir et al. (2020), Najafi et al. (2016), and Rostamzadeh et al. (2016), there is a significant relationship between Opiate abuse and the mortality rate of hospitalized patients with a cardiac disease, which is not consistent with the findings of the present study. This discrepancy can be attributed to differences in sample size and the fact that the above-mentioned works are cohort studies. Also, differences in cultural contexts and economic and social conditions can explain the discrepancy [17-19]. The study of Moezi Bady et al. (2020) shows that diabetic patients with a history of cardiac arrest who are addicted to opium are more likely to be re-hospitalized and die than patients who do not abuse Opiate [20].

The results of the present study show that there is not a significant relationship between Opiate abuse and type and location of cardiac arrest. This finding is consistent with the results of the studies of Nadimi et al. (2016) and Roohafz et al.(2013) [21-22]. Furthermore, in the current study, the most common treatment for cardiac arrest for both abusers and non-abusers of opium was found to be Primary PTCA which is a modern method that replaced coronary artery bypass surgery for treating many patients with blocked coronary arteries. Research show that over 85% of patients with a cardiovascular disease can be treated by angioplasty. This method is a safer, less invasive, and more economical treatment than coronary artery bypass surgery. It has also been found to result in shorter hospital stays for patients [23-24].

LIMITATIONS

Since drug abuse is influenced by cultural, social, and economic factors, the findings of the present study may not be transferrable to other regions of Iran or other countries. Therefore, there is a need for more research, especially cohort studies, with larger sample sizes. Our study limitations included inaccurate amount of causes, the route of abuse, the followed observational design, the potential for residual confounding, and self –reported data.

CONCLUSION

Given the increase in Opiate abuse and smoking which are significant risk factors in cardiovascular diseases, especially cardiac arrest, it is vital for senior healthcare administrators to take effective measures to raise public awareness about the potential harms of Opiate abuse and smoking and develop executive plans to control and eliminate these risk factors. The promotion of self-care behaviors can also play a major part in improving public health and minimizing health risk factors.

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