ORIGINAL ARTICLE

Comparison of the frequency and status of coronary artery involvement in coronary angiography of opioid addicted and non-addicted individuals admitted in the cardiology ward of Imam Reza Hospital during 6 months

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Abstract

Introduction: Opium abuse has become a major and growing problem in most countries of the world, including Iran. The Central Nervous System (CNS) is the most affected system by opium, although the cardiovascular and respiratory systems can be affected too. The aim of this study was to compare coronary angiographic data in patients admitted with and without opioid addiction in Imam Reza (p) Hospital for six months (October 2017 to March 2018).

Methods: The following cross-sectional study, patients with stable ischemic heart disease who were admitted to Imam Reza (p) Hospital for coronary angiography were studied. Risk factors for cardiovascular disease such as age, body mass index (BMI), diabetes mellitus, hyperlipidemia, hypertension, past evidence of heart problems (CVD), physical inactivity, history of heart disease in first-degree relatives and past or present cigarette smoking. Information on the history of opioid addiction was also collected for the above individuals. Coronary angiographic findings were recorded for each patient and the results were compared. Group 1 consisted of cases with minimal stenosis or without stenosis. Group 2 consisted cases with equal or more than 70% stenosis in single, 2 or 3 vessels or more than 50% stenosis in left main. Finally, the two groups of addicted and non-addicted people were compared in terms of angiographic findings.

Results: No significant difference was observed among the two groups In terms of BMI, diabetes mellitus, hyperlipidemia, hypertension, past evidence of heart problems (CVD), physical inactivity, history of heart disease in first-degree relatives and smoking. Additionally, No significant difference in the incidence of angiographic problems was found between opioid addicts and non-addict cases.

Conclusion: The adverse effects of opioid addiction on different organs such as the cardiovascular system is a challenging subject In term of probable protective effects of these compounds against cardiac problems or their inductive effects on heart problems The current study found no significant relationship between opioid addiction and coronary angiographic findings. Further investigation with larger sample size is recommended.

Keywords: Opioid, addiction, coronary angiography

INTRODUCTION

As a crude material, opium is retrieved from a plant named *Papaver somniferum*. It is an effective substance in acute and chronic pain relief, however, it may lead to a wide range of problems. Opium use is a major problem in many countries, such as Iran. The central nervous system (CNS) is the most affected system by opium, although the cardiovascular and respiratory systems can be affected too (1-5). Opium is the most commonly reported abused substance in Iran and the next most abused substance in the Middle East after tobacco. Opium is transited through Iran from producing countries, such as Afghanistan. Ease of access is another reason for high consumption of this substance in our country. The third reason is the traditional belief among people that opium can have some useful and protective effects on cardiovascular disorders (CVDs) and control of blood sugar in diabetics, control of hypertension, and dyslipidemia. Several studies based on human and animal subjects have assessed the effect of opium use on CVDs and glucose and serum lipid levels, however, this assumption only a few studies investigated (6). Opium use was reported in more than 20 million people and approximately 19% of individuals with a history of myocardial infarction. The substance has several desirable

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health effects such as analgesia, antidiarrheal and anti-cough effects., Studies also display that opium use is reported more in patients who suffer from chronic diseases such as hypertension, diabetes, and ischemic heart disease, compared to the overall population because of its risk factors on cardiovascular disease (7). The aim of this research was to compare coronary angiography data in patients with stable ischemic heart disease admitted with and without opioid addiction in Imam Reza (p) Hospital for six months (October 2017 to March 2018).

METHODS

A cross-sectional research was performed in patients with stable ischemic heart disease suspected of having acute coronary syndrome, admitted to Imam Reza (p) Hospital for a coronary angiography procedure from October 2017 to March 2018. The study's proposal was submitted and approved by the committee of medical ethics in the research vice chancellor of Mashhad University of Medical Sciences (IR.MUMS.fm.REC. 1396.529). The study's goals were explained to patients who met the inclusion criteria and their consent was obtained. All patients who consented to participate in the study were included. Cases who have suffered an attack of myocardial infarction during recent months were excluded. For all patients, cardiovascular risk factors were evaluated, including age, body mass index (BMI), diabetes mellitus, hyperlipidemia, hypertension, past evidence of heart problems (CVD), physical inactivity, history of heart disease in first-degree relatives and past or present cigarette smoking. The patients were asked if they had a history of opioid addiction; if positive, a checklist containing information including the type and amount of opioid used, method of use, and duration of use (in months) was completed for the above individuals. All patients underwent angiography by a cardiologist associate professor (the first executive of the project) and coronary angiographic findings in three forms: minimal stenosis (<50% luminal narrowing) or without stenosis, significant stenosis (>= 70% luminal narrowing of one vessel (SVD)) 'two vessel (2VD) or left main 'three vessel (3VD) with details of vascular involvement were recorded for each patient. Finally, two groups of people with and without opioid addiction were compared in terms of angiographic findings.

RESULTS

From the 168 male patients studied over a period of one year, 139 (82.7%) individuals were not addicted to opioids and 29 patients (17.3%) used opioids. From the 29 opioid users, 20 (69%) used opium, eight (27.6%) used Shireh (a partly purified form of opium) and one (3.4%) used methadone. The method of consumption in 14 patients (48.3%) were oral and in 13 (44.8%) were inhalation. Most patients (or individuals) used opioids for one to two years (48.2%), 13.8% for more than two years and 6.8% for less than one year. The amount of consumption was 1-10 grams daily (for patients who used theriac or Shireh) and 20 mg per day for those who used methadone. The age and BMI of Individuals with an opioid addiction (group A) and without an opioid addiction (group B) were compared and a T-test was used to calculate the mean and standard deviation (SD).

The mean (± SD) age of group B was 61 ± 11.5 years and the mean (± SD) age of group A was 59.6 (± 8.5) years. There was no statistically significant difference between the two groups in terms of age (P-value = 0.540) or BMI (P value = 0.173).In group B, 107 individuals (77%) did not have a history of suffering from diabetes mellitus and 32 (23.0%) did. In group A, 22 individuals (75.9%) did not have a history of diabetes and 7 (24.1%) did. There was no significant difference found between the two groups (P value = 0.8970). In group B, 75 individuals (54.0%) had no hyperlipidemia and 64 (46.0%) suffered from hyperlipidemia. In group A, 19 individuals (65.5%) had no hyperlipidemia and 10 (34.5%) had hyperlipidemia (P value = 0.22540). There was no significant difference found between the two groups. The mean (±SD) systolic blood pressure and mean (±SD) diastolic blood pressure in group B were 141.8 (±17.9) and 83.1 (±11) respectively. The mean (±SD) systolic blood pressure and mean (±SD) diastolic blood pressure in group A were 133 (±15.9) and 83.1 (±10.1) respectively.

In group B, 68 individuals (48.9%) did not have hypertension (SBP>140mm hg and /or DBP>90 mm hg) and 71 (51.1%) had hypertension. In group A, 15 individuals (51.7%) did not have hypertension and 14(48.3%) had high blood pressure. There was no significant difference found for hypertension between the two groups (P value = 0.7840). In group B, 102 individuals (73.4%) did not have a history of heart disease and 37 (26.6%) did. In group A, 20 individuals (69%) did not have a history of heart disease and 9 (31%) did There was no significant difference found between the two groups (P value= 0.6280). In group B, 10 individuals (7.2%) exercised regularly, 53 38.1%) walked regularly (at least 30 minutes a day for 5 days a week), and 76 (54.7%) had no physical activity. In group A, 1 individual (3.4%) exercised, 11 (37.9%) walked regularly and 17 (58.6%) did not have any physical activity. Using the t-test, no significant difference was found between the two groups (P value = 0.7480). In group B, 98 individuals (70.5%) had no history of heart disease in first-degree relatives and 41 (29.5%) had a family history of heart disease. In group A, 10 individuals (34.5%) had a family history of heart disease and 19 (65.5%) did not. There was no significant difference found between the two groups. From the 139 individuals in group B, 5(3.5%) reported cigarette smoking and 116 (83.4%) individuals did not. From the 29 individuals in group A, 6 (20.6%) reported cigarette smoking and 20 (68.9%) individuals did not. It is important to note that 12 (8.6%) individuals from group B and 2 (6.9%) individuals from group A used hookah (a water pipe method for smoking tobacco). Angiography results were compared between two groups: group1: cases with minimal stenosis or without stenosis, group2: cases with equal or more than 70% stenosis in single, 2 or 3 vessels or more than 50% stenosis in left main. There was no significant difference found between the incidence of angiographic problems between opioid addicts and non-addict cases.

DISCUSSION

The aim of this study was to investigate opioid abuse and its relationship with the extent and severity of coronary vessel involvement. Misconceptions about opium use and longevity,

as well as creating a protective factor against cardiac problems (such as heart attacks), lead to an increased tendency of individuals to consume opioids. Furthermore, some individuals believe that opium consumption can control or eradicate DM (8). The findings of our study suggest that there are no significant differences between opioid abusers and non-opioid abusers in terms of CVD risk factors and findings of coronary angiography. In a study by Aghadavoudi et al, 325 candidates (117 opium abusers and 208 non-opium abusers) for elective bypass grafting of the coronary artery were evaluated during a 6-month period. Opium addiction was recognized from patients' history. In the beginning of the study, they evaluated the patients' Lipid profile from serum and the distribution and frequency of coronary artery disease were assessed from the pre-operative coronary angiographies of opium-addicted and non-addicted cases. The mean duration of opium abuse in opium-addicted cases was 12.6 ± 7.7 years, which was longer than the duration of opioid use in addict cases in our study. The authors mentioned no significant difference in mean total serum cholesterol levels between the two groups, but found the addicted group had a significantly higher mean low-density lipoprotein cholesterol level and mean triglyceride level compared to the non-addict group. On the contrary, the prevalence of diabetes, serum glucose levels and mean BMI were higher in non-opium addicted cases. Angiography findings were not compared according to the aim of that study (2). On the other hand, some investigations in Iran have shown that opium has protective effects on cardiovascular risk factors, such as, hyperlipidemia, hypertension, diabetes and cardiovascular disease (9-12). Some studies placed emphasis on one gender group; For example, the results of a study by Sadeghian et al. showed that the most important risk factor for CAD in men is opium use (13). Moreover, Khodneva et al. described opiate-addicted females have a higher risk of CHD compared to opiate non-addicted females (14). Sharafi et al. Conducted a retrospective study of 1,545 men under PCI, and the results showed that non-opioid vascular involvement was more common in these addicted men (15).

All participants in the study were male. At the Tehran Heart Center, a case-control analysis was performed between 2009 and 2012 and young cases who experienced coronary angiography and cases with CAD were compared with controls in terms of recreational opium consumption. The relationship between opium use and main cardiovascular risk factors (age, gender, body mass index, cigarette smoking, hyperlipidemia, hypertension, and diabetes.) were analyzed. In this study, the investigators compared 1011 cases with CAD and 2002 controls. Habitual opium consumers were 3.8 times more at risk of CAD in comparison with non-opium users. Taking into account other risk factors, the authors concluded that recreational opium consumption is associated with an increased risk of CAD (16). A 2019 review article about the effects of opium on the cardiovascular system that investigated all human published studies found the majority of published articles reported adverse effects of opium use on the cardiovascular system. The most suggested adverse

effects included atherosclerosis, arrhythmia, low ejection fraction, myocardial infarction and cardiovascular mortality. They concluded that opium does not have any no protective or beneficial effects on cardiovascular problems(1). A study in South Khorasan Province, Birjand, recruited 1051 diabetic patients/individuals who underwent coronary angiography and studied the effect of opioid use on the extent of CAD in these patients from 2011 to 2015. The authors reported that the risk of CAD among opium-addicted diabetics was 0.44 folds higher than non-addicted diabetics, however there was no difference between the two groups regarding the extent of coronary vessel involvement (8). A systematic review was performed on related articles up to June 2016 and revealed that the age of patients at the occurrence time of myocardial infarction, percutaneous intervention and coronary bypass surgery, was significantly lower in opium users than that of non-opium users (7). A cohort study conducted in Rafsanjan on 9990 participants, found that 296 and 870 cases suffered from MI and IHD, respectively. The authors reported that Opium consumption was relatively high in the participants, particularly in men. They also reported increased odds for the two methods of opium use: oral and smoking respectively (17). In a case-control study in Gonabad, 276 cases were recommended for angiography. The case group had more than 50% stenosis in the vessel lumen based on angiography reports and the control group had less than 50% stenosis. The authors assessed the history of opium consumption and smoking, method of usage and also the history of diabetes which were recorded in the checklist. Cholesterol, triglyceride and FBS were extracted and entered in the checklist. The authors found a significant relationship between coronary artery disease and opium abuse. This study focused on the relationship between opium use and coronary artery disease, cardiovascular events and heart attack (18). Shafie et al in Tehran investigated 242 patients with pure CAE (Coronary Artery Ectasia (CAE) without Coronary Artery disease) and selected 968 individuals with normal coronary angiography as the control group. They pointed out the effect of opium consumption on hyper-inflammatory state and risk of atherosclerosis as contributing factors to coronary artery ectasia (CAE) development. They found no significant difference between cases with pure CAE and patients who had normal coronary angiograms in terms of opium consumption (19).

Nadimi et al carried out a cross-sectional study on 250 Iranian cases. They compared 125 patients with the diagnosis of Microvascular Coronary dysfunction (MCD) with 125 consecutive control cases in terms of demographic clinical characteristics, social factors and past medical history. In this study, 250 Iranians with symptoms of myocardial ischemia participated in an exercise test that indicates class I or II for coronary angiography, including: 1- MCD diagnosis with slow_flow phenomenon and normal coronary arteries 2- without evidence of MCD and with normal angiogram. They found a meaningful relationship between microvascular angina and opium addiction (20). A study was carried out on 200 opium users who were candidates for coronary angiography in Kerman. Among them, 134 cases with CAD were selected based on angiographic results. The cases were

divided into 2 groups: mild CAD (< 50% stenosis) and severe CAD (> 50% stenosis). The investigators reported that 77.6% of the opium addicts had Severe coronary artery stenosis in angiography although this study did not find a meaningful relationship between the positive urinary morphine test and the severity of CAD and the authors suggested that other opium alkaloids should be evaluated in urine screening test (19). In another retrospective study in Zahedan (2007-2010), 400 cases who were admitted because of occurring MI for the first time were included. 19.5% of all cases were opium-dependent. The investigators reported that mortality rate in the opium-dependent group was higher (but no significant difference) than non-opium addict cases (11.5% and 5.9%, respectively); likewise, the number of re-admissions in hospital due to heart problems was meaningfully higher in the cases who were opium-dependent (P < 0.001) (21). We could not confirm opioid addiction quantitatively and this is the major diagnostic limitation of our study; a limitation found in most similar investigations in our country because of the lack of common access to more accurate, quantitative diagnostic techniques in most medical centers.

CONCLUSION

In the present study, no significant differences were observed in angiographic findings and cardiovascular risk factors between addicted and non-addicted groups. It is recommended to do more research with a larger sample size.

Conflict of Interest: None to be declared.

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