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Original Article

The comparison of post OPCABG complications between opium addicted and non- addicted patients

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Abstract

Objectives: Opium addiction is one of the fundamental public health problems today that could influence cardiovascular disease outcomes. Recent studies have shown that opium addiction may increase the risk of postoperative complications in patients undergoing on-pump coronary artery bypass graft surgery. In this retrospective cross-sectional study, we aimed to assess whether opium addiction may affect the postoperative complications of off-pump coronary artery bypass graft surgery (OPCAB) (1).

Methods: In this cross-sectional study, we searched the clinical records of all patients who underwent OPCAB surgery from 2017/03/21/ to 2018/03/19/ at Afshar and Seyed Al-Shohada Hospitals in Yazd, Iran. We evaluated the patients for postoperative complications. Complete patient demographic and clinical data collected through a review of patient records. Finally, the collected data were analyzed using SPSS software version 18.

Results: A total of 889 patients (667 (76.2%) non-addicted, 127 (14.3%) opium addicts, and 86 (9.6%) smokers and opium addicts) met our criteria and were included in the study. The average age of the participants was 62.09 ± 9.8 years. Frequency distribution of the most postoperative variables such as intubation duration, intensive care unit (ICU) stay, postoperative bleeding volume, pack cell count, need for fresh frozen plasma (FFP), platelet injection volume, need for reoperation, need for intra-aortic balloon pump, as well as Atrial fibrillation (AF) rhythm showed no significant difference between the three groups. However, the only significant difference between the three groups reported the need for postoperative use of inotropic drugs (p=.001).

Conclusions: According to the results, the only complication that differed significantly in the three patient groups after OPCAB was the need for inotropic drugs.

Keywords: Coronary Artery Bypass Off-Pump, Coronary Artery Disease,smoking,opium,cardiotonic agents

Introduction

Coronary artery bypass graft surgery (CABG) is the most commonly performed surgical procedure worldwide, with 400,000 cases per year (2). Also, it has been reported in Iran that about 60% of open-heart surgeries are CABG (3). In CABG, the blocked and narrowed coronary artery is bypassed with a

vascular graft (vein or artery) to restore blood supply. This restoration could relieve angina symptoms and restore heart viability and function (4, 5), while reducing the risk of myocardial infarction and its complications.

On-pump surgery is the most commonly used method. In this method, the heart and lungs are stopped to create a bloodless field for the operation, and a machine (cardiopulmonary bypass bypass machine) provides oxygen and blood flow to all other body organs (6). Although there is some doubt about the long-term patency of the graft in off-pump coronary artery bypass graft (OPCAB) surgery, in this method all anastomoses are performed on the beating heart and the heart wall is stabilized by some instruments around the target vessel, which is why surgeons prefer it due to the lower rate of cerebrovascular accidents (CVA), psychomotor defects, transfusion rates, systemic inflammation, kidney failure and organ damage (7-9).

Some studies reported addiction to Opium as a risk factor for peri- and post-operative complications that occurred in patients undergoing CABG surgery (10-12). In Iran, as in many other countries, addiction is a social and health problem (12-15). Iran ranks second in the world for opium addiction (13, 16). Addiction to opioids has been linked to an increased risk of cardiovascular disease and cancer (14). However, one reason for the high level of opium use among the Iranian population is the misconception that opium is useful in controlling high blood pressure and diabetes and prevent cardiac diseases (17). Interestingly, opioid addiction in Iranian patients undergoing CABG surgery is high (9% to 16%) (18-22).

Coronary artery bypass graft surgery is a major surgery with many potential complications. Too many studies have evaluated risk factors for post-operative complications. To our knowledge, there are not enough studies to evaluate addiction as a risk factor for post-CABG complications (23). Therefore, this retrospective cross-sectional study was designed to evaluate the effect of opium addiction on post-operative complications.

Materials and Methods

Study design and participants

This cross-sectional study investigated all of the patients undergoing OPCAB, referred to Afshar and Seyed Al-Shohada hospitals in Yazd, Iran, from 21/03/2017 to 19/03/2018.

Patients with a history of heart failure with ejection fraction (23) < 30%, cardiac surgery, and concomitant CABG and cardiac valve surgery were excluded from the study.

Complete patients' demographic and clinical data, before and after surgery, were collected using the patients' clinical records.

Data collection

Data collection performed by a trained nurse

To collect data, we used a pre-prepared questionnaire containing the demographic and clinical information of patients, such as age, sex, history of blood pressure, history of diabetes, history of opium consumption, smoking, bleeding volume during ICU hospitalization, AF rhythm history (based on the history of taking anti-AF drugs), duration of intubation, the blood volume injected in ICU, the injected platelets volume, the need for inotropic drugs,(adrenaline or noradrenaline more than 0.05mcg/kg/min during first 24 hours after surgery) the need for intra-aortic balloon pump, need for re-surgery, the volume of fresh frozen plasma (FFP) injected in ICU, and Ejection fraction (23). According to patients' history and using the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), they were divided into three groups: addicted to opium, addicted to opium and cigarette, and non-addicted (24).

Statistical Analysis

Statistical analyzes were performed using SPSS for Windows software (version 18.0.0). Descriptive statistics, means and standard deviations, and inferential statistics including chi-square, t-test, and ANOVA were performed. In case of non-normality, non-parametric tests were used. The p-value < 0.05 was considered significant.

Ethical Considerations

All patients' information was kept confidential. The study was approved by the Ethical Committee of Shahid Sadoughi University of Medical Sciences,Yazd,Iran(IR.SSU.MEDICINE.REC.1397.086) and conducted in accordance with the Helsinki Declaration. Written consent was obtained from all patients.

Results

A total of 889 patients underwent OPCAB. All met our criteria and were included in the present

study. The mean age of the patients was 62,099.8 years, ranging from 28 to 102. The mean EF of the patients was 43,488.8.Six hundred sixty-seven patients (67.2%) were not addicted, and 85 were addicted to both opium and smoke. Most of the patients (821 patients) survived (92.4%). The characteristics of patients are summarized in Table 1.

Table 1. Characteristics of patients who underwent OPCAB

Characteristic	Cases N*=889	Percent %
Addiction		
None-addict	677	76.2
Opium-addict	127	14.3
Opium and cigarette addict	85	9.6
Diabetes		
Yes	426	47.9
No	449	50.5
Missing data	6	0.7
Hypertension		
Yes	510	57.4
No	366	41.2
Missing data	1	0.1
COPD		
Yes	76	8.5
No	803	90.3
Missing data	1	0.1
Mortality in the hospital		
Yes	22	2.5
No	821	92.4
Missing data	46	5.2

*N indicates the number of patients

Frequency distribution of the most postoperative variables such as intubation duration, intensive care unit (ICU) stay, postoperative bleeding volume, pack cell count, need for fresh frozen plasma (FFP) Table 2 as well as platelet injection volume, need for reoperation, need for intra-aortic balloon pump and Atrial fibrillation (AF) rhythm (Table 3) showed no significant difference between the three groups. However, the only significant difference between the three groups was reported the need for postoperative use of inotropic drugs (p-value = 0.001).

Table 2. Distribution of postoperative complications in patients

Variables*	Group			p-value
	Non-addict	Opium addict	Addicted to opium and smoking	
Intubation duration (13)	13.99±35.48	10.69±11.18	7.84±4.05	0.271
ICU stay (13)	4.94±4.73	4.64±2.22	4.91±3.92	0.787
Bleeding volume (cc)	1579.1±1074.7	1662.2±1033.59	1410.7±551.83	0.265
Injected packed RBC volume (cc)	0.35±1.32	0.52±2.22	0.31±1.09	0.389
Injected FFP volume (pack)	1.84±1.94	1.86±2.62	1.52±1.45	0.489
Injected palatet volume (pack)	0.65±2.5	0.84±4.87	0.49±2.37	0.692

*Variables defined as mean ± standard division

Table 3. Distribution of postoperative complications of OPCAB in patients

Variables	Group			Total	p-value
	Non-addict	Opium addict	Addicted to opium and smoking		
Mortality in the hospital					
Yes	17 (77.3%)	2(9.1%)	3(13.6%)	22(100%)	0.860
No	624(92.2%)	118(92.9%)	79(9.6%)	821(100%)	
Need for re-surgery					
Yes	14(82.4%)	3(17.6%)	0(0%)	17(100%)	0.389
No	643(76.1%)	118(92.9%)	84(9.9%)	845(100%)	
Missing data	4(100%)	0(0%)	0(0%)	4(100%)	
Need for inotropic drugs					
Yes	244(84.4%)	24(8.3%)	21(7.3%)	289(100%)	0.001
No	401(71.9%)	96(17.2%)	61(10.9%)	558(100%)	
Need for intra-aortic balloon pump					
Yes	51(76.1%)	11(16.4%)	5(7.5)	67(100%)	0.966
No	591(76.1%)	109(14%)	77(9.9)	777(100%)	
Missing data	1(100%)	0(0%)	0(0%)	1(100%)	
AF rhythm incidence					
Yes	75(78.1%)	13(13.5%)	8(8.3%)	96(100)	0.983
No	570(75.9%)	107(14.2%)	74(9.9%)	751(100%)	
Missing data	1(100%)	0(0%)	0(0%)	1(100%)	

Discussion

The main findings of this study demonstrated that the only postoperative complication that was significantly associated with opium addiction after OPCAB was the postoperative inotropic drug administration with high doses (>= 0.05mcg/kg/min) during the first 24 hours after surgery, while other complications showed no significant difference between the three groups. Opium addiction has been recognized as a common global health and social problem, particularly in Middle East countries. In Iran, opium and its derivatives are the most commonly abused illicit drugs, and more than 3% of the general population is addicted to them (15, 25-27).There is some controversy about the protective effects of opium on coronary artery disease. Although previous studies showed that opium use reduces inflammation (28, 29), and long-term opium consumption is associated with lower severity of coronary artery disease (30), other studies have reported that opium use is a risk factor for coronary artery disease (15, 31). Additionally, it has been observed that in animal models, opium consumption increases the formation of atherosclerotic plaques (32).

According to the results of previous studies, the long-term mortality rate after CABG in opium addicts was higher than in non-addicts (33, 34), while the short-term survival of patients after CABG was similar in both groups (19, 35), which are consistent with the results of the present study. Previous studies have reported conflicting reports of postoperative AF rhythm. According to a previous clinical trial, the prevalence of postoperative arrhythmias was similar in both groups of opium addicts and non-addicts after performing CABG(36), However, in another group of studies, performed with the on-pump CABG method, opium use was suggested as a predictor of AF rhythm (11, 20). In contrast, we did not find significant differences in the prevalence of postoperative AF rhythm between different groups after OPCAB.

Habibi et al., who used the on-pump CABG method in their study, showed that the rate of postoperative volume bleeding was higher in opium addicts than in non-addicts (11), while in our study, there was no significant difference in the volume of postoperative bleeding between addicts and non-addicts.

In our study, the need for postoperative inotropic drugs was significantly associated with opium addiction. Findings of another study among patients who underwent CABG demonstrated that inotropic drugs utilization in opium addicts was higher than non-addicts in the operating room and in the ICU (36), which agrees with our results.

This might be due to the higher doses of opioid administration for analgesia in addict cases. moreover, some of these patients probably have abused opioids at the time of admission without permission. Hence, they might present with low blood pressure and require higher doses of inotropic for their hemodynamic stabilization.

The advantage of our study compared to previous studies was the separate evaluation of opium-only and opium-and-cigarette-addicted patients in separate groups, which may help to better identify postoperative complications of opium addiction. Also, this study had a larger statistical sample compared to previous studies, and female opium addicts were also included in the study. On the other hand, reviewing the registered patient record prevented recall bias.This study had some limitations. The first limitation was the possibility of AF rhythm occurrence before CABG in smoking patients, since cigarette smoking increases the risk of AF rhythm occurrence (37). The second limitation was the use of antiplatelet and anti-coagulant medications in some patients prior to surgery, which affected postoperative bleeding volume. Nevertheless, further studies are recommended in the future to gain a more detailed insight into the impact of opium addiction on the post-surgical outcomes of on-pump and OPCAB. Care should also be taken to find various alternative treatment methods with the least amount of postoperative complications for patients addicted to different drugs and substances.

Conclusion

The results of the present study showed that the rate of postoperative complications from OPCAB is similar in opium addicts and non-addicts, and the only postoperative complication that had a significant association with opium use was the need for high doses of inotropic drugs after surgery. It is suggested that prospective studies be conducted to further investigate the prognosis of opium-dependent patients after POCABG surgery.

Conflicts of Interest

There is no conflict of interest to be declared.

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