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Investigating the Effect of Opium Addiction on Serum Glucose and Lipid Profiles in Diabetic Patients with Acute Coronary Syndromes

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Abstract

Background: Opium is one of the most commonly abused substances in Iran. Understanding the relationship between unhealthy drug use and clinical outcomes is essential due to its public health implications.

Objectives: This study aimed to investigate the effect of opium addiction on serum glucose and lipid profiles in diabetic patients with acute coronary syndromes (ACS).

Methods: In this cross-sectional study, 99 diabetic patients with ACS were examined. Demographic characteristics and laboratory parameters including hemoglobin A1c (HbA1c), fasting blood sugar (FBS), total cholesterol, high-density lipoprotein (HDL), low-density lipoprotein (LDL), and triglycerides (TG) were recorded. Patients were divided into two groups: Those who used opium and those who did not. All variables were compared between the two groups. Data analysis was performed using SPSS version 18.

Results: The mean age of patients in the opium and non-opium groups was 47.4 ± 11.01 and 47.5 ± 11.12 years, respectively. There was no significant difference between the groups in terms of serum glucose levels ($P > 0.05$). Additionally, no significant difference was found in TG, total cholesterol, LDL, and HDL between patients who used opium and those who did not ($P > 0.05$).

Conclusions: This study found that opium use did not have any positive or negative effect on serum glucose levels or lipid profiles in diabetic patients with ACS. Therefore, our results cannot be generalized with certainty.

Keywords: Acute Coronary Syndrome, Opium, Diabetes Mellitus, Addiction

1. Background

Addiction is a significant social and health problem in many countries, including Iran (1). Opium is the most commonly abused substance in Iran after tobacco (2). While opioids are widely recognized for their pain-relieving properties, they also affect various other organs, including the central nervous system, intestines, lungs, and heart (3). Opium, primarily derived from the seeds of the Papaver somniferum plant, contains various alkaloids such as morphine, papaverine, codeine, thebaine, and noscapine, which may be responsible for its diverse effects (4).

There is a common belief among the general population that opium has health benefits, such as reducing the risk of diabetes mellitus (DM), hypertension (HTN), and hyperlipidemia (HLP) (2). However, different studies have revealed that opium consumption can be a risk factor for coronary artery disease (CAD) (2). Cardiovascular diseases (CVDs) are the most common cause of death worldwide, and in Iran, about 43% of all mortalities are caused by CVDs (5). Therefore, understanding the relationship between unhealthy drug use and clinical outcomes is essential for public health (6).

The growing incidence of diabetes poses a major global health concern (7). By 2030, it is estimated to become the seventh leading cause of death globally (8). Recent research indicates that opium may have short-term effects that transiently elevate blood lipids; however, its prolonged use can exacerbate diabetes and dyslipidemia. Conversely, reducing substance use in

patients with DM may result in better clinical outcomes (9, 10). One study has shown that substance abuse significantly reduced fasting blood sugar (FBS) in diabetic patients, although the differences were not significant in relation to postprandial blood sugar and glycosylated hemoglobin (11).

2. Objectives

Due to the controversial findings in recent studies, this study set out to investigate the effect of opium addiction on serum glucose and lipid profiles in diabetic patients with acute coronary syndromes (ACS).

3. Methods

3.1. Study Design

In this cross-sectional study, diabetic patients with ACS who were referred to Imam Hossein Hospital in Shahroud, Iran, were investigated. Patients with a history of DM diagnosed for more than six months were included in the study. Patients with type 1 diabetes or with creatinine clearance less than 30 ml/min were excluded. Informed consent was obtained from all participants.

3.2. Data Collection

Demographic characteristics of the patients, including age, sex, and body mass index (BMI), as well as laboratory parameters such as hemoglobin A1c (HbA1c), FBS, total cholesterol, high-density lipoprotein (HDL), low-density lipoprotein (LDL), and triglycerides (TG), were recorded.

The patients were divided into two groups: The opium group, which included 50 patients with a history of DM who were admitted due to ACS and had used oral opium for at least 6 months and at least 3 days a week. These patients experienced withdrawal symptoms such as nausea, vomiting, diarrhea, anxiety, and insomnia when they did not use opium. The non-opium group included 49 patients who did not use opium at all.

3.3. Statistical Analysis

Data descriptions were presented as median ± standard deviation and frequency (percent). The chi-square test and independent t-test were used to evaluate the differences between the two groups—opium users and non-opium users. A P-value of less than 0.05 was considered statistically significant. All data analyses were performed using SPSS version 18.

4. Results

A total of 99 patients participated in the study. The mean age of the patients in the opium group was 47.4 ± 11.01 years, while in the non-opium group, it was 47.5 ± 11.12 years. Most of the patients were male, with 62% in the opium group and 66% in the non-opium group. Additionally, 76% of the patients in the opium group and 70% in the non-opium group had a BMI in the normal range (Table 1).

Table 1. Comparison of Demographic Characteristics of Patients in Opium and Non-opium Group

Variables	Opium	Non-opium	P-Value
Age (y)	47.4 ± 11.01	47.5 ± 11.12	> 0.05
Sex			> 0.05
Male	31 (62)	33 (66)	
Female	19 (38)	17 (34)	
BMI (kg/m ^{2})			> 0.05
Underweight	1 (2)	2 (4)	
Normal	38 (76)	35 (70)	
Overweight	6 (12)	7 (14)	
Obese	5 (10)	6 (12)	

Abbreviation: BMI, body mass index.

Based on our findings, opium use did not affect FBS or HbA1C levels, as no significant difference was found between the groups in terms of serum glucose (P > 0.05). Moreover, opium use did not affect lipid profiles. There was no significant difference in TG, total cholesterol, LDL, and HDL levels between patients who used opium and those who did not (P > 0.05) (Table 2).

Table 2. Comparison of Laboratory Parameters in Opium and Non-opium Group

Variables	Opium	Non-opium	P-Value
FBS	261.2 ± 60.8	265.8 ± 58.6	> 0.05
HbA1C	7.1 ± 0.8	7.3 ± 0.7)	> 0.05
TG	296.1 ± 30.9	301.4 ± 36.02	> 0.05
Total Chol	263.7 ±26.7	155.1 ±15.8	> 0.05
LDL	153.3 ±15.9	155.1 ±15.8	> 0.05
HDL	48.7 ± 14.4	47.7 ± 13.2	> 0.05

Abbreviations: HbA1C, hemoglobin A1C; FBS, fasting blood sugar; Total Chol, total cholesterol; HDL, high-density lipoprotein; LDL, low-density lipoprotein; TG, triglyceride.

5. Discussion

Opium is the most commonly abused substance in Iran after tobacco (2), and it is commonly believed among the general population that opium has health benefits, such as reducing the risk of DM, HTN, and HLP (2). In this study, we investigated the effect of opium

addiction on serum glucose and lipid profiles in diabetic patients with ACS. Based on our findings, opium did not affect fasting blood sugar, HbA1C, or lipid profiles, including triglycerides, total cholesterol, LDL, and HDL, in diabetic patients with ACS.

Consistent with our findings, other studies have shown that opium has no positive impact on FBS levels (12, 13). Similarly, Fallahzadeh et al. demonstrated that FBS, lipid profile, and BMI did not differ significantly between patients who used opium and those who did not (14). However, contrasting our findings, Hamrah et al. found that opium use was associated with the male gender, decreased total cholesterol, and lower FBS levels. This may be due to short-term hormonal and neural effects (15). Another study reported a positive impact of opium on reducing total cholesterol levels (16). In our study, opium use was not related to gender. Opium users may experience reduced FBS levels primarily because opium's anorexic effect diminishes insulin sensitivity and lowers BMI (10).

Another study by Kazemi et al. in Iran, conducted on patients with cardiovascular disease (CVD), found a correlation between opium use and decreased levels of total cholesterol and LDL. However, opium users exhibited lower levels of HDL within the normal range. It is recommended that healthcare professionals and patients be aware of the detrimental impact of opium use on various vascular events (17). A systematic review of diabetic patients demonstrated that total cholesterol was lower in patients who used opium, but no significant differences were found between users and non-users in other lipid profiles (6). Lipid raft microdomains, which are present in the outer layer of the plasma membrane, harbor high levels of cholesterol and are also the location for opioid receptors, including the μ-opioid receptor (MOR), κ-opioid receptor (KOR), and δ-opioid receptor (DOR), along with various signaling factors such as G protein-coupled receptors (GPCRs) (18). A previous study indicated that lowering cholesterol levels could decrease the internalization of DOR in HEK293 cells (19).

It has been shown that opioid agonists with effects on KOR can reduce the consumption of carbohydrate-to-fat ratio in rats (20). Another study, which considered factors such as fat intake, BMI, and other confounding variables, demonstrated that opium users had reduced total cholesterol levels (17). People have used opium for many years because of their beliefs about its beneficial effects on DM, HLP, and CVDs. According to available evidence, opium not only lacks a protective effect on heart disease but is also associated with increased risks of CVDs and cardiovascular mortality (21).

5.1. Conclusions

The results of our study showed that opium use did not have any positive or negative effects on serum levels of glucose or lipid profiles. However, given the different studies with controversial findings on this topic, and considering that opium consumption is influenced by cultural, behavioral, and personality factors, and can vary in different regions, we cannot generalize our results with certainty.

Footnotes

Authors' Contribution: Study concept and design, critical revision of the manuscript for important intellectual content, and study supervision: S. N.; acquisition of data, and drafting of the manuscript: M. B.; analysis and interpretation of data, and administrative, technical, and material support: Kh. Ch.; statistical analysis: M. B. and Kh. Ch.

Conflict of Interests Statement: The authors declared no conflict of interest.

Data Availability: The dataset presented in the study is available on request from the corresponding author during submission or after its publication. The data are not publicly available due to patient's privacy.

Ethical Approval: Given that the present article is derived from the first author's general medical thesis, which was conducted during the years 1395 - 1396 (2016 - 2017 in the Gregorian calendar), the ethics code for this project is not available in the "National Ethics System in Biomedical Research."

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Informed Consent: Informed consent was obtained from all participants.

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