

Opium Consumption Challenge and Diabetes Mellitus Control

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Received: 10 March 2011 - **Accepted:** 25 April 2011

ABSTRACT

OBJECTIVE: During recent years, opium consumption has increased among Iranian diabetic men. The belief that opium consumption can control or even eradicate DM is increasing. This study was conducted to compare the blood sugar, HbA1c, lipid profile and the frequency of diabetes complications in male type II diabetic patient with and without opium consumption.

MATERIALS AND METHODS: Two hundred thirty two type 2 diabetic men were included in a case- control study between September 2009 and June 2010. They were divided into two groups: with (n= 88), and without (n=144) current opium consumption. Serum glucose was measured by two methods: hexokinase (automized and manual) and orthotolidine method, and Hb A1C was measured by chromatographic ion exchange. The opium consumption was evaluated by thin-layer chromatography (TLC) of urine. Analyses were performed using SPSS and $P \leq 0.05$ was considered significant.

RESULTS: There was not a significant age difference between two groups. The mean duration of opium use was 36 ± 6 months. The difference between mean serum fasting glucose levels in different methods of measurement was not significant between case and control groups. The results of this study showed a significant lower level of serum HbA1C ($p=0.006$) and triglyceride ($p=0.005$) in diabetic patients with opium abuse, but the frequency of peripheral neuropathy and ophthalmic photocoagulation was not different between two groups.

CONCLUSION: Although the HbA1c was lower in males with opium consumption, the frequency of chronic complications of diabetes was not significantly different between two groups. We didn't evaluate other complications of opium consumption, especially mental and physical dependence. In summary, despite observed effects on some of glucose indices, opium is not a harmless treatment for diabetes.

KEY WORDS: opium, diabetes, glucose, HbA1c, thin-layer chromatography

INTRODUCTION

Diabetes mellitus is one of the most important factors of mortality and morbidity in a society (1). The question which the Iranian endocrinologist should answer almost every day is whether opium is effective in the treatment of

diabetes mellitus (DM) or not. According to unpublished reports, during recent years, the consumption of opium among Iranian diabetic men has increased. Its main cause is probably the geographic location of Iran with a long border with Afghanistan and the ease of access to these substances; but the belief that opium

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consumption can control or even eradicate DM, is increasing.

Our information about the effect of opium in improvement or intensification of hyperglycemia is limited. There are a few recent studies and mainly with small sample size that have examined this effect on human (2,3,4). It is probably due to illegal access to these substances which have been caused hidden consumption, so most of them refuse to declare it or enter such studies.

While, some studies show reduced insulin response to exogenous glucose administration and abnormal glucose tolerance in opium users (5,6,7), there are studies that show normal glucose tolerance among consumers (8), and opium consumption as the cause of fasting blood sugar decrease (9) or even opium discontinuation as the cause of intensification of hyperglycemia (10). According to our expert idea, opium discontinuation intensifies the hyperglycemia of addicted diabetic patients. Since, in opium consumers with long-term consumption, the chronic complications of diabetes is observed as well, so this idea was formed that interference of opium or its additives with glucose measurement is probably the cause of its unreal lower blood sugar reports.

This study was designed to compare the fasting blood sugar (FBS) measured by different biochemical methods, the index of long-term blood sugar control, HbA1c, long-term diabetes complications and also lipid profile in male type II diabetic patients with and without opium consumption in Arak, Iran.

MATERIALS AND METHODS

The diabetic male patients whose disease had been diagnosed previously and were going to endocrinology clinic at Amir Almoemenin Hospital-Arak for periodic outpatient visit, enrolled in this study. Of 246 male participants with a visit between September 2009 and June 2010, we excluded those who had critical or serious diabetes complications including nephropathy (serum Cr \geq 1.6 mg/dl), vision loss/blindness or limb amputation (n = 14) resulting in 232 participants including 88

subjects with 144 subjects without opium addiction. "Opium use" was defined as self-reported use of opium since three months ago up to 12 hours before our visit.

The demographic information including disease history, drug consumption and its period and type of opium consumption were obtained by a questionnaire.

The blood and urine samples were taken after 12 hours fasting at 8:00 AM. The blood samples were poured into two separate test tubes: One for HbA1c level measurement and the other after separation of serum was frozen in - 20°C until measurements. Serum glucose was measured by two methods: hexokinase (automized and manual) and orthotolidine methods.

Blood urea nitrogen and creatinine were measured by the standard methodology in central laboratory.

The opium assessment was performed by urine TLC (Bahar Afshan Kit, Iran) and Hb A1C was measured by chromatographic ion exchange (Biosystems S.A, Spain) with detection limit of lower than 4.5%.

The protocol was followed principles of the Declaration of Helsinki and was approved by the institutional research boards of Arak University of Medical Sciences and an informed consent was obtained from all participants.

Analyses were performed using SPSS version 16.3. Univariate associations of participant characteristics were determined by chi square, parametric (t-test) or non-parametric (Mann-Whitney) tests, as appropriate.

Multivariate logistic regression analysis was used to identify independent predictors of diabetes prevalence. All models were adjusted for the potentially confounding effects of variables and $P \leq 0.05$ was considered significant.

RESULTS

In this cross-sectional study we included 232 type 2 diabetic male patients with opium use (case =88) and without opium use (control=144). The mean age, Body Mass

Index (BMI) and duration of diabetes was not significantly different between two groups. All drug dependents and abusers had only used opium, and there were no reports of any other drug use. The correctness of opium consumption in patients was proved by above qualitative method. The mean duration of opium use was 36±6 months. Patients' demographic characteristics are summarized in Table 1. Our study didn't show any significant difference in frequency of peripheral neuropathy and history of ophthalmic photocoagulation in patients with and without opium consumption. The difference in mean serum fasting glucose levels measured by different methods of measurement was not significant between groups. The results of this study showed a significant lower level of serum HbA1C (p=0.006) and triglyceride (p=0.005) in diabetes patients with opium use (Tables 2 and 3). In Multivariate logistic regression analysis with regarding to age, duration of diabetes, BMI and lipid profile, difference in HbA1c was significant between two groups. (p=0.003)

DISCUSSION

In current study, while the long-term index for glucose control (HbA1c) was lower in subjects with opium consumption, there was no difference between FBS measured by different methods in two groups. Therefore, our results showed that opium consumption doesn't affect different methods of glucose measuring. Among other indices, triglyceride level was significantly lower in case group.

Laila Azod and coworkers (9) compared twenty-three males addicted to opium with type 2 diabetes as the case group, and 46 patients with no addiction as control group and found a significant lower FBS and 2h post-prandial glucose level in diabetic patients with opium consumption but no significant difference was observed in HbA1C.

On the other hand, Karam GA and coworkers evaluated the effect of opium on biochemical parameters in twenty-three male addicts with type 2 diabetes and reported that opium addiction in NIDDM subjects increased serum glucose and decreased HDL-C. (11)

Sedigheh Asgary and her colleagues (12) in

Table 1-Demographic characteristics of study population.

Variables	Age (mean±SD, yr)	DM duration (mean±SD, yr)	On Insulin therapy (%)	Ophthalmic laser History (%)	Peripheral neuropathy (%)
With opium consumption	55±10.8	9.8±6.4	15	42	47
Without opium consumption	57±12.6	7.8±5.4	16	40	42
P value	0.21	0.84	0.56	0.44	0.58

Table 2- Serum glucose measurement by different methods in diabetic patients with and without opium consumption.

Variabls	FBS(HEX)* mean±SD mg/dl	FBS(ORT)**mean±SD mg/dl	HgA1C %
With opium consumption	140±88	117±49	9.5±2.4
Without opium consumption	141±64	116±42	11±2.5
P value	0.71	0.93	0.006

*Fasting blood suger * Hexokinase method

** Orthotolidine method

Table 3-lipid profile in diabetic patients with and without opium consumption.

Variables	TG mean±SD mg/dl	CHOL mean±SD mg/dl	LDL mean±SD mg/dl	HDL mean±SD mg/dl
With opium consumption	164±88	174±34	107±28	38±7
Without opium consumption	220±86	182±27	108±24	38±12
P value	0.005	0.18	0.92	0.90

another study showed no difference in HbA1c and FBS in males with and without opium consumption but their population study consisted of normal (non-diabetic) subjects.

Since, the sample size in our survey was several times as much of Azod and Karam GA studies, it seems that our results are more precise. Furthermore, decrease in triglyceride level concurrent with reduction of HbA1c that provides an integrated measurement of blood glucose during previous 2–3 months, were expected results which were observed in this study.

What is the justification for these effects?

There are experimental studies which show opposing results; opium consumption, is the cause of impaired glucose tolerance, and increased resistance to insulin. On the other hand, there are case reports of severe hyperglycemia due to opium withdrawal, and our unproved experiences show the hyperglycemia aggravation in patients after opium discontinuation.

The studies have shown that opium consumption can decrease the serum cortisol level and cortisol response to ACTH (13, 14), although in another survey (15), growth hormone secretion decrease due to long-term intra-theal administration of opioids is reported. So the reduction of liver glucose production due to counter-regulatory hormones decrease may be a justification for decrease of HbA1c index in people with opium consumption.

We should emphasize on this point that according to present findings, we can't conclude that opium consumption is useful and advisable for diabetes control; because the frequency of peripheral neuropathy and ophthalmic photocoagulation in opium

consumers was the same as control group; although, longer duration of diabetes and absence of a history of opium consumption from the onset of disease may influence the results that are related to chronic diabetes complications. On the other hand in our study, probable influences of opium consumption, especially mental and physical dependence as well as unpleasant effects on person's individual, familial and social life were not evaluated.

Since keeping and transporting of drugs are illegal in our country, the present study had serious limitations, naming some of them:

1. The consumed opium was imported illegally and it was impossible to evaluate its purity as well as morphine percent.
2. The amount of opium consumption by different patients was not similar, and the measurement scale was not according to standard index and only the patient's report was recorded.
3. The method of consuming among different patients was not similar. Some of them consumed it orally and some via inhalation and some used both methods.

In summary, despite observed effect on some glucose indices, our answer to patients' question is negative, because safe consumption of these substances can't be precisely evaluated by this study or similar studies.

ACKNOWLEDGEMENTS

We would like to thank the staffs of Arak medical reference's laboratory for their friendly cooperation in this research.

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