Journal of Research in Pharmacy Practice

Brief Communication

Response to thrombolytic agents in acute myocardial infarction in opium abusers versus non-abusers

Seyed Mohammad Hashemi Jazi[1], Idin Ahang Nazary[1], Mohaddeseh Behjati[1]

[1]Department of Cardiology, Isfahan University of Medical Sciences, Isfahan, Iran

ABSTRACT

Objective: Coronary artery disease is one of the leading causes of morbidity and mortality in populations. In opium abusers, level of circulating coagulation factors differs from non-abusers. The aim of this study was to evaluate response to thrombolytic therapy in opium abusers vs. non-abusers.

Methods: In this prospective observational study, 83 patients (36 opium abusers and 47 non-abusers) with AMI were evaluated for the presence and degree of response to thrombolytic agent. All patients were monitored for electrocardiographic changes and response to thrombolysis 2 hours before and after administration of thrombolytic agent. Serum CPK and LDH were measured 2 hours before and after thrombolysis. Quantitative and qualitative data were analyzed by independent *t*-test and chi-square using SPSS, respectively.

Findings: ST-resolution 2 hours after thrombolysis was 63.8% and 44.4% in opium users and non-users, respectively. Serum level of CPK cardiac biomarker 2 hours after thrombolysis was 980 ± 245 and 847 ± 130 IU/L in opium users and non-users, respectively.

Conclusion: Our data demonstrate that in those patients with opium abuse, electrocardiographic changes after thrombolysis were significantly lower than opium non-users ($P < 0.05$). Opium users showed better ST-resolution compared with non-users. Opium addiction had effect on cardiac enzymes despite their effect on response to streptokinase.

Keywords: Acute myocardial infarction; opium addiction; ST-resolution; thrombolysis

Received: November 2011
Accepted: April 2012

Corresponding author:
Dr. Mohaddeseh Behjati
E-mail: behjati@med.mui.ac.ir

INTRODUCTION

Opium addiction seems to be a common problem in many societies. Opium is air-dried milky exudate of *Papaver somniferum L.*[1] There are some traditional believes about the beneficial effects of opium on hypertension, diabetes mellitus, and cardiovascular disease (CVD).[2] Some data indicate deleterious effects of opium on cardiovascular system.[3,4] Cardioprotective function of morphine in an animal model is shown previously.[1] Some others found no relationship between opium and CVD.[5,6] This controversy may be due to the confounding factors as different dose, route, constituents, and frequency of opium consumption and association with other substances as tobacco, cigarette smoking, alcohol, and narcotic or tranquilizer drugs.[1] Some differences between the animal model and human body may also explain this difference.

Acute myocardial infarction is the most common cause of morbidity and mortality in populations.[7] Opioid peptides may also be involved in cardiac preconditioning.[8] Preconditioning is the ability of short ischemia to protect the heart damage from subsequent prolonged insult.[4] Then, a smaller infarct size in proportion to the area at risk will result.[4] Morphine and d1-opioid receptor agonist induce preconditioning.[9,10] Beneficial effects of opium on ischemic preconditioning may be associated with better heart protection from acute ischemic event as better response to thrombolytic therapy. So, in this study we evaluated the effect of opium addiction on ST-resolution and cardiac enzymes after streptokinase administration.

Access this article online

Website: www.jrpp.net

DOI: ***

METHODS

In this prospective observational study, during 7 months, 83 patients (36 opium abusers and 47 non-abusers) with AMI were evaluated. Positive opium urine test was necessary for inclusion in this study. Patients with contraindication of thrombolysis, positive urine test for other substances rather than opium, opium abusing less than 3 months, and amount of abused opium less than 1 g/day were excluded from the study. Non-abusers, who received opium analgesia during transfer to hospital and without urine sample for test up to 5 minutes, were excluded from the study. Patients on drugs such as chlorpromazine and dextrometorphan were also excluded due to the incorrect opium urine test results. Patients were monitored for electrocardiographic changes and response to thrombolysis 2 hours before and after administration of thrombolytic agent. Patients were evaluated for the presence and degree of response to thrombolytic agent. Serum CPK and LDH were measured 2 hours before and after thrombolysis. Response to thrombolytic therapy was defined as ST-resolution more than 50% observed in ECG lead with worst initial ST segment elevation within 3 hours after streptokinase administration. Quantitative and qualitative data were analyzed by independent *t*-test and chi-square test using SPSS software (version 16.0, Chicago), respectively.

RESULTS

In this study in non-abuser group, 28 (49%) patients were males, whereas this datum was 25 (70%) in opium abusers. Q-wave and ST-resolution after streptokinase injection in opium abusers and non-abusers were 63.8% and 47.2%, respectively. These ECG responses were significant in opium abusers vs. non-abusers ($P < 0.05$). Serum CPK levels 24 hours after streptokinase injection in opium abusers and non-abusers were 980 ± 245 and 847 ± 130 IU/L, respectively. There was no significant difference between these groups ($P > 0.05$).

DISCUSSION

Opium is used by some people in some societies for the treatment of hypertension, diabetes mellitus, and cardiovascular.[2] About beneficial or disadvantages of opium on cardiovascular diseases, there are controversies. The relation between abrupt discontinuation of opium and triggered acute myocardial infarction is also controversial. Myocardial infarction occurred in younger ages in opium users.[4] In opium users, higher prevalence of mortality and longer delay from onset of chest pain to hospital admission was reported by masking symptoms.[4] Data about effects of opium on patient response to fibrinolytic therapy are not determined. It is previously shown that in-hospital mortality after acute myocardial infarction was more in opium abusers vs. non-abusers.[4] In this study, hospitalization period was longer in opium users.[4] In another study, no significant association was found between opium addiction and response to thrombolytic.[11] Elevated levels of opioid-like peptides like beta-endorphin were reported in patients after acute myocardial infarction.[12] Opioid drugs such as morphine are considered to be cardioprotective, which may also decrease the infarct size.[12] Opioids provide cardioprotection through action of opioid receptors involved in remote ischemic preconditioning.[13] Central and peripheral opioid receptors mediate morphine preconditioning, but only peripheral opioid receptors in I ischemic preconditioning.[14]

They are also involved in patient's pain relief.[12] Then, opium users seem to have better response to medical treatments if they transferred to hospital soon after pain onset. Opium addiction is common in many societies and their response to common medical treatments for myocardial infarction as thrombolytic therapy is not determined. Our data demonstrate beneficial effects of opium on the outcomes of thrombolytic therapy as ST-segment resolution. Better response to thrombolytic agents in opium users indicates smaller infarct size.

ST-resolution was more significant in opium abusers compared with non-abusers. Opiums showed no effect on cardiac enzymes after myocardial infarction despite their positive effect on response to streptokinase.

AUTHORS' CONTRIBUTION

All authors contributed the idea of research, design of study, data analysis and manuscript preparation.

REFERENCES

1. Joukar S, Najafipour H, Malekpour-Afshar R, Mirzaeipour F, Nasri HR. The effect of passive opium smoking on cardiovascular indices of rabbits with normal and ischemic hearts. Open Cardiovasc Med J 2010;4:1-6.
2. Masoumi M, Shahesmaeili A, Mirzazadeh A, Tavakoli M, Ali AZ. Opium addiction and severity of coronary artery disease: A case-control study. J Res Med Sci 2010;15:27-32.
3. Asgary S, Sarrafzadegan N, Naderi GA, Rozbehani R. Effect of opium addiction on new and traditional cardiovascular risk factors: do duration of addiction and route of administration matter? Lipids Health Dis 2008;7:42.
4. Sadr BSM, Rafiei M, Bahadorzadeh L, Namayandeh SM, Soltani MH, Motafaker M, *et al*. Is opium addiction a risk factor for acute myocardial infarction? Acta Med Iran 2005;43:218-22.

5. Davoodi G, Sadeghian S, Akhondzadeh S, Darvish S, Alidoosti M, Amirzadegan A. Comparison of specifications, short term outcome and prognosis of acute myocardial infarction in opium dependent patients and nondependents. J Tehran Heart Center 2006;1:43-7.
6. Azimzade-Sarwar B, Gholamreza YG, Narooey S. A case-control study of effect of opium addiction on myocardial infarction. Am J Appl Sci 2005;2:1134-5.
7. Yavuz S. Surgery as early revascularization after acute myocardial infarction. Anadolu Kardiyol Derg 2008;8 Suppl 2:84-92.
8. Peart JN, Gross ER, Gross GJ. Opioid-induced preconditioning: recent advances and future perspectives. Vascul Pharmacol 2005;42:211-8.
9. Schultz J, Hsu AK, Nagase H, Gross GJ. TAN-67, a delta 1-opioid receptor agonist, reduces infarct size via activation of Gi/o proteins and KATP channels. Am J Physiol 1998;274:H909-14.
10. Schultz JJ, Hsu AK, Gross GJ. Ischemic preconditioning and morphine-induced cardioprotection involve the delta (delta)-opioid receptor in the intact rat heart. J Mol Cell Cardiol 1997;29:2187-95.
11. Masoomi M, Ghaemi F, Haghdost A, Rashidinejad H. ST segment resolution in opium addiction patients after thrombolytic therapy for acute myocardial infarction. ARYA Atheroscler 2008;4:103-7.
12. Azimzade-Sarwar B, Yousefzade Gh, Narooey Sh. A case-control study of effect of opium addiction on myocardial infarction. Am J Appl Sci 2005;2:1134-5.
13. Lu Y, Dong CS, Yu JM, Li H. Morphine Reduces the Threshold of Remote Ischemic Preconditioning Against Myocardial Ischemia and Reperfusion Injury in Rats: The Role of Opioid Receptors. J Cardiothorac Vasc Anesth 2012;26:403-6.
14. Lu Y, Dong C, Yu J, Li L. Role of central and peripheral opioid receptors in the cardioprotection of intravenous morphine preconditioning. Ir J Med Sci 2011;180:881-5.

How to cite this article: ???

Source of Support: Nil, **Conflict of Interest:** None declared.