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Original Research Article

Prevalence of addiction in Iranian myocardial infarction patients: a systematic review and meta-analysis

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Abstract

Objective: the aim of this study was to evaluate Prevalence of addiction in Iranian myocardial infarction patients.
Methods: The present systematic investigation applies developed methods that are consistent with the accurate instructions in the PRISMA check list. Observational studies, including posting to editors, publications, poor quality articles (based on the Hoy's tool) and studies on adult subjects were only excluded from the study. Only articles in English and Persian are included.
Results: Six studies conducted on 2137 addict people were included in the meta-analysis, the overall Prevalence of addiction in 2137 Iranian myocardial infarction patients was 20.4% (95% CI: 18.6, 22.1; $I^2 = 94.9\%$)
Conclusion: The results show that opium addiction is a strong risk factor for myocardial infarction.

Keywords: addiction, myocardial infarction, MI, prevalence.

Introduction

Myocardial infarctions cause significant mortality and morbidity in drug addicts. Functioning like opioid neurotransmitters, narcotics stimulate opioid receptors(1). Most opioids do not have significant direct effects on the heart and do not alter heart rate or heart rhythm(2). Blood pressure is usually well preserved unless the cardiovascular system is under stress, a complication which might decrease blood pressure(3). This drop in blood pressure is probably due to dilation of the arteries and peripheral veins, which is attributed to a number of mechanisms, including the release of histamine and the weakening of vasomotor mechanisms. The most common consequence of such a phenomenon is acute myocardial infarction. The follow-up period is within a short timeframe in most survival studies(4). Very few researches have studied long periods of, say, 5 years. Studying long periods of time, as it may show the impact of factors affecting survival on different periods from short periods, is of great importance(5,6). Studies conducted in different parts of the world have introduced various factors such as age and sex, hypertension, diabetes, smoking and hyperlipidemia as predictors of survival of patients after acute myocardial infarction(7); reviewing other variables that may be able to predict survival of these patients, including the type of clinical interventions, the type of diagnostic procedure, drug addiction, the history of disease in first-class members, etc., will enable researchers to establish a more precise model for identifying groups at high risk in order to help care providers(8).the aim of this study was to evaluate Prevalence of addiction in Iranian myocardial infarction patients.

Materials and Methods

The present systematic investigation applies developed methods that are consistent with the accurate instructions in the PRISMA check list.

Inclusion and exclusion criteria

Observational studies, including posting to editors, publications, poor quality articles (based on the Hoy's tool) and studies on adult subjects were only excluded from the study. Only articles in English and Persian are included.

Sampling methods and sample size

All observational studies with any sampling and statistical surveys were included in the present systematic study.

Research strategy

Two separate researchers conducted studies until November 2018 at international (PubMed, Google Scholar, and WOS) and national (SID and Magiran) databases in English and Persian, without any time limit. We examined a list of available articles sources for further related article searches. Specific research strategies have been developed using the MESH vocabulary explorer and free vocabularies, according to the PRESS standard, by a Health scientist librarian specializing in research on systematic review. We used the MEDLINE research strategy to investigate other databases. The key words used in the research strategy included: addiction , myocardial infarction , MI , prevalence, frequency, and Iran, which were combined with Boolean agents such as AND, OR, NOT.

Selection of research and data extraction:

Two separate researchers examined the titles and abstracts by considering qualifying criteria. After removing the repetitive research, the full text of the research was examined depending on the qualifying criteria and the required data was extracted.

To answer questions regarding qualifications, additional research information was obtained from the authors in case it is required. The general information (first author, province, and year of publication), research characteristics (sampling method, research design, location, sample size and bias risk), and the measurement of results (prevalence of addiction) were also collected.

Quality assessment and abstraction:

Hoy's et al. tool was used to assess the methodological quality and the risk of getting away from the truth (bias) for each one of the observational studies. This tool evaluates 10 items for assessing the quality of studies in two dimensions such as foreign (items 1-4, target population, sampling frame, sampling method and the minimum deviation from response) and domestic credits (the issues 5-9 of the data collection method, case definition, research tool, data collection mode were assessed while the issue 10 of the bias evaluation was related to data analysis). The higher index indicated that the bias is likely to reduce and the lower index indicated the risk of more bias. The separate bias risk was investigated by two researchers. Consensus was used to solve the disagreements.

Data combination:

The final data extracted using the STAT 14.0 statistical software, including studies combined with stock diagram and the prevalence of addiction, were assessed with random effect of the model.

Results

Selection of research:

A total of 510 primary studies were reviewed from PubMed, Google scholar, SID, Magiran, and Web of Science from the beginning to November 1, 2018. Out of the 405 non-repetitive studies in the title and abstract of the screening process, 365 were excluded since their titles were unrelated. Out of the 40 studies, 6 had qualifying criteria. Out of 34 removed cases, six were reviewed, five were letter to the editor , 10 studies did not have a complete text, and 13 did not meet the minimum quality requirements for inclusion in the article [Figure 1].
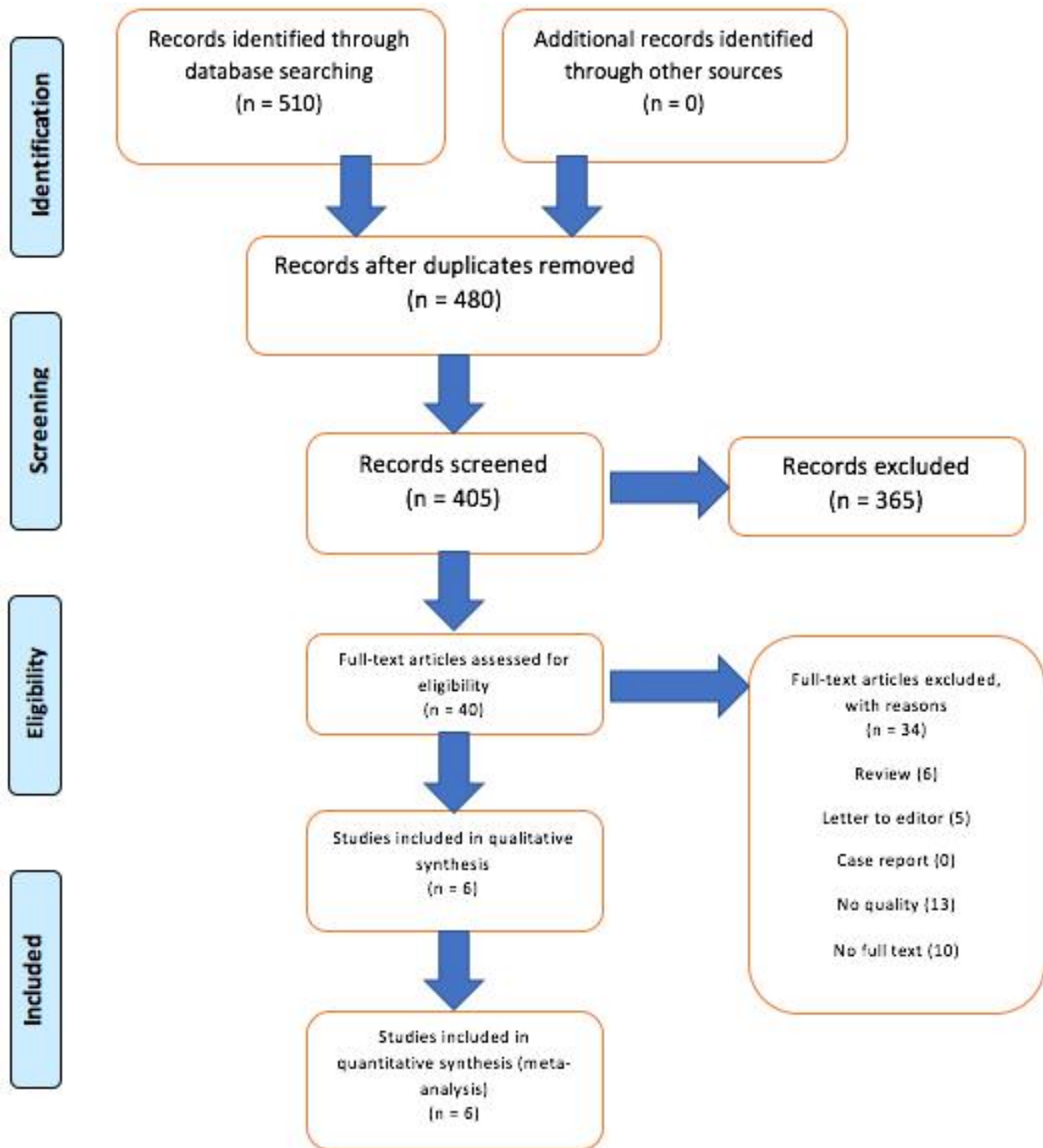
Fig 1. Study selection process

Research characteristics

These 6 studies were conducted on 2137myocardial infarction patients. Out of the 6 studies, 5 provided cross-sectional data and the next research was a prospective study . Out of the 6 studies, three studies was from rasht, kerman and Babol, and two from gilan and Mashhad provinces and one of them was from yazd. The most commonly used sampling method was convenience (easiness), (n = 4). The most common place to conduct the studies was in the hospital (n = 1). (Table 1).

Table 1. Studies included in the systematic review (N=6)

First Author	year	Province	Sample size	Female to male	Risk of bias
Bafghi[16]	2005	Yazd	556	----	Low
Afraz[17]	2002	Rasht	676	36%	Low
Hamzei[18]	2012	Kerman	97	22%	Low
Niaki[19]	2013	Babol	118	45%	Low
Saberi[20]	2015	Gilan	83	88%	Low
Musafarkhani[21]	2014	Mashhad	607	-----	Low

Prevalence of addiction in Iranian myocardial infarction patients:

Six studies conducted on 2137 addict people were included in the meta-analysis, the overall Prevalence of addiction in 2137 Iranian myocardial infarction patients was 20.4% (95% CI: 18.6, 22.1; I^2 = 94.9%) [Table 2].

Table 2 : Prevalence of addiction in Iranian myocardial infarction patients

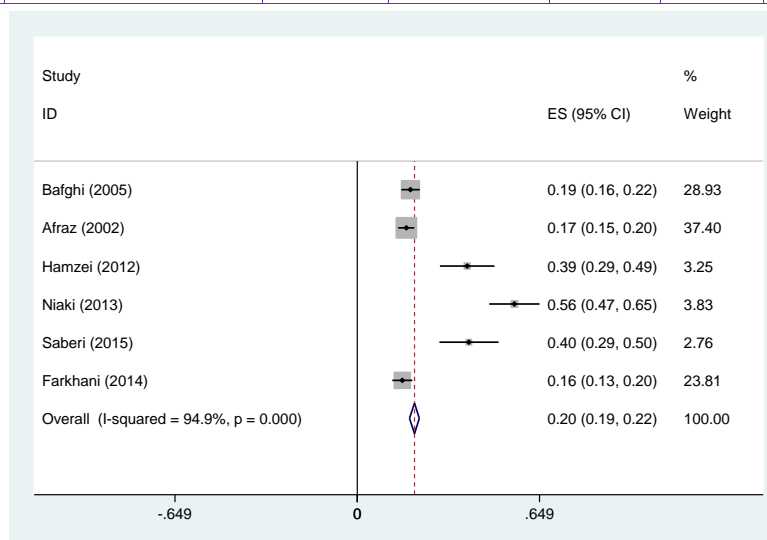| ID	First Author	Year	Province	ES	95% CI for ES		% Wight
					Low	Up	
1	Bafghi	2005	Yazd	0.190	0.157	0.223	28.93
2	Afraz	2002	Rasht	0.175	0.146	0.204	37.40
3	Hamzei	2012	Kerman	0.392	0.295	0.489	3.25
4	Niaki	2013	Babol	0.560	0.471	0.649	3.83
5	Saberi	2015	Gilan	0.398	0.293	0.503	2.76
6	Musafarkhani	2014	Mashhad	0.161	0.125	0.197	23.81
Sub-total Random pooled ES	------	-----	------	0.204	0.186	0.221	100

Fig. 2 : The Prevalence of addiction in Iranian myocardial infarction patients and its 95% interval for the studied cases according to the year and the city where the study was conducted based on the model of the random effects model. The midpoint of each section of the line estimates the% value and the length of the lines showing the 95% confidence interval in each study. The oval sign shows Prevalence of addiction in Iranian myocardial infarction patients for all studies.

Discussion

The overall Prevalence of addiction in 2137 Iranian myocardial infarction patients was 20.4% (95% CI: 18.6, 22.1; I^2 = 94.9%) .As stated in the introduction, myocardial infarctions cause significant mortality and morbidity in drug addicts.

The sudden withdrawal of opioids or the use of opioid antagonists in addicts leads to signs of withdrawal syndrome(9). This syndrome is a form of real physical stress that causes severe muscle pain, vomiting, sweating, and stinging. A transient increase in catecholamines may be due to tachycardia, and hypertension, which is described as overshoot hypothesis (releasing catecholamines can cause coronary artery perfusion depletion and coronary artery depletion)(10).

The potential mechanisms can be as follows; reduction of coronary flow, micro-vascular dysfunction, direct effects of catecholamines on cardiac myocytes through increased calcium mediated by cAMP, free oxygen radicals, clot formation in vascular tissue, atherosclerosis, hypertension and contraction(11). It is well-known that narcotics such as opiates have important harmful effects on a number of physiological and pathological conditions, such as immune system, pulmonary disease, nephropathy, stroke, and especially cardiovascular risk factors(12). Given the above mentioned negative repercussion, addiction increases the risk of disability and even mortality due to cardiac events. Drug addiction has been shown to increase premature mortality by more than twice as many non-addicts as a result of acute MI(13). Furthermore, several studies have been conducted on the protective role of opioids on cardiovascular events. This effect may lead to satisfaction and increase the quality of life of patients. (Long-term use of opium and associated alkaloids has been reported to reduce CAD severity and, thus, reduce the incidence of fatal and severe MI). It has also been shown that individuals who suffer from drug dependence may eventually develop a syndrome after years of opium use, thus increasing the risk of MI in such subjects(14,15).

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