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The Relationship between Opioid Addiction and Diameter of the Common Bile Duct

Bita Dadpour[1] (MD); Veda Vakili[2] (MD); Robabeh Parhizi[3] (MSc); Soudabeh Jalal[4] (MSc); Maryam Parhizkar[4] (MSc); Abbas Esmaeelzadeh[5] (MD); Majid Khadem Rezaiyan[6*] (MD)

1. Addiction Research Centre, Department of Clinical Toxicology, Faculty of Medicine, Imam Reza Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.
2. Department of Community Medicine, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.
3. Medical toxicology Research Centre, Imam Reza Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.
4. Cardiac Anesthesia Research Centre, Imam Reza Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.
5. Department of Internal Medicine, Imam Reza Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.
6. Department of Community Medicine and Public Health, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

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ABSTRACT

Introduction: According to statistics, opioid addiction is quite common in Iran. Pathologic dilatation of the Common Bile Duct (CBD) may be caused by mechanical obstruction or opioid consumption; the latter is especially common among chronic opium abusers. The aim of this study was to assess the relationship between CBD diameter and addiction-related factors in opium users.

Materials and Methods: This cross-sectional study was conducted in Imam Reza Hospital, Mashhad, Iran. A checklist, consisting of 18 items on demographic characteristics, type, administration route, and duration of opioid consumption, and type of biliary disease as indicated by Endoscopic Retrograde Cholangiopancreatography (ERCP), was prepared and completed via interview. The results of ERCP and abdominal ultrasonography of 40 addicted patients were gathered. Data were analyzed, using SPSS version 11.5. P-value less than 0.05 was considered statistically significant.

Results: In total, 31 (62%) out of 50 patients were male, and the mean age of the subjects was 66±12.0 years. According to the findings, 46 (92%) cases were addicted to opium and four (8%) cases to laudanum (a solution prepared from opium). Among the addicted cases, 30 (75%) used opium through inhalation, while 10 (25%) cases used it orally. There was a significant relationship between the type of opioid and CBD diameter (P=0.03). However, no significant relationship was found between CBD diameter and the route of administration or opioid dose (P=0.6 and 0.06, respectively).

Conclusion: Opium used by addicts has various degrees of impurity. It can be concluded that higher opium purity induces more CBD dilatation, although further investigations are highly recommended.

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Introduction

Opium was originally used for medical purposes, whereas today, it is being widely abused in many countries including Iran. Addiction, which is associated with various health hazards for abusers, has been discussed as a social problem for many years (1).

One of the associated health risks is the negative effect on the sphincter of Oddi, which causes a delay in gallbladder emptying patterns (2, 3).

Ultrasonography is the primary imaging modality for assessing the bile ducts. Common Bile Duct (CBD) dilation may have various etiologies, including CBD stones, tumor of the pancreatic head, tumors of the ampulla of Vater, masses, and enlargement of the hilar lymph nodes in the liver. In case of mechanical obstruction, the etiology of obstruction may be identified via ultrasonography. Otherwise, methods

***Corresponding Author:** Majid Khadem Rezaiyan, Department of Community Medicine and Public Health, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran. Email: Khademrm921@mums.ac.ir

such as computed tomography, Endoscopic Retrograde Cholangiopancreatography (ERCP), percutaneous transhepatic cholangiography, and even CBD exploration through surgical operation may be essential (4, 5).

Pathologic dilatation of CBD may be caused by mechanical obstruction or opioid consumption; the latter is particularly common among chronic opium abusers (6). Although few studies have assessed sonographic findings in opium addicts, to the best of our knowledge, no research has evaluated both sonographic findings and ERCP results. Therefore, the aim of this study was to assess the relationship between CBD diameter and addiction-related factors in opium addicts.

Materials and Methods

This cross-sectional study was conducted on 40 opium addicts, who underwent ERCP in Imam Reza Hospital, which is one of the two major hospitals in Mashhad, Iran in 2013-2014. Mashhad, as the capital city of Razavi Khorasan Province, is the second most populous city in Iran.

A checklist containing 18 items on demographic characteristics, type of opioid, route of administration, duration of use, type of biliary disease as indicated by ERCP, and other related factors (through abdominal ultrasonography and ERCP findings) was completed for the purpose of data collection.

The study samples were selected via convenience sampling, based on the inclusion and exclusion criteria. The only inclusion criterion was being an opium addict, while the exclusion criterion was a prior history of hepatobiliary disease, which can affect CBD. ERCP was performed for all cases due to suspected CBD stones. All ERCP procedures were performed by a single specialist in internal medicine, based on the standard protocol. Informed consent forms were obtained prior to data collection, and the subjects were assured about the confidentiality of the data.

For statistical analysis, SPSS version 11.5 (SPSS Inc., Chicago, Illinois, USA) was used. Standard descriptive statistics were calculated to describe the distribution of the data. Normality of the data was checked, using Kolmogorov–Smirnov test. Pearson's and Spearman's correlation tests were applied, and all tests were two-tailed. P-value less than 0.05 was considered statistically significant.

Results

In total, 31 (62%) out of 50 subjects were male, and the mean age of the subjects was 66±12.03 years. As the findings indicated, 46 (92%) cases were addicted to opium and four (8%) cases to laudanum. Among the addicted subjects, 30 (75%) used opium via inhalation, while 10 (25%) cases used it orally. ERCP was performed on 46 patients (92%) with a major complaint of abdominal pain and on four patients (8%) for cholangitis.

Based on the findings, CBD diameter was 14.09±5 and 14.4±8 mm on abdominal sonography and ERCP, respectively. Laboratory findings are presented in Table 1.

Table1: Laboratory findings in the study sample

	Mean	Standard deviation
Alanine aminotransferase	116.6	165.37
Aspartate transaminase	98.26	153.34
Total bilirubin	5.40	7.25
Direct bilirubin	3.97	4.05
Alkaline phosphatase (ALP)	887.93	658.15

Moreover, as demonstrated in Table 2, only Alkaline Phosphatase (ALP) level was significantly correlated with CBD diameter (r=0.34, P=0.01). Besides, CBD diameter was significantly greater among laudanum users (20±1), compared to opium users (14±4) (P<0.001). Based on sonography and ERCP findings, there was a significant association between CBD diameter and type of opioid (P<0.001).

Table2: The correlation between study variables and CBD diameter

	Correlation coefficient	P-value
Age	0.04	0.7
Duration of addiction	0.05	0.6
Alanine aminotransferase	0.07	0.6
Aspartate transaminase	0.04	0.5
Total bilirubin level	0.04	0.7
Direct bilirubin level	0.10	0.4
Alkaline phosphatase (ALP)	0.34	0.01

Discussion

This cross-sectional study was performed to assess the relationship between opium addiction and CBD diameter, based on ERCP and ultrasonography findings. As the results indicated, the majority of patients were male and inhalation was the dominant mode of opioid use. CBD diameter was only 4 mm different in measurements, performed via two different modalities. This shows the high specificity of ultrasonography and its cost-effectiveness for measuring CBD diameter, especially in opium addicts; however, lower values have been reported via ultrasound imaging in previous research (1).

The present findings are in line with previous reports on the dilating effects of opiates on CBD (7-11). Dilatation of CBD may be attributed to the effects of opium. In fact, use of opium for a long period of time results in CBD dilatation by inducing sphincter spasms. Based on some separate studies, CBD diameter in

opium addicts was greater than the control group (4, 6, 10, 11).

The aging process in the evaluated patients should be taken into account, especially since the mean age of the study sample was > 65 years. This effect may be attributed to the fragmentation of longitudinal smooth muscle bundles and the intervening connective tissues of CBD wall (7). In fact, the positive correlation between age and CBD diameter has been previously revealed (4, 5, 6, 8, 9).

In the present study, as the majority of patients had complaints of abdominal pain, we expected abnormal levels of liver enzymes, bilirubin, and ALP. Based on our analysis, among all laboratory findings, only ALP level was significantly correlated with CBD diameter; this can be due to the limited sample size of this study.

In this study, we did not find a significant correlation between CBD diameter and aspartate transaminase, alanine aminotransferase, total bilirubin, or direct bilirubin level, whereas in a previous study in Tehran, a significant correlation was detected (12). Also, type of opium was significantly correlated with CBD diameter, as different types of this substance can induce varying serum levels; therefore, the induced impacts on an internal organ, e.g., CBD, may be diverse. One of the strengths of this study was that all ERCP procedures were performed by a single gastroenterologist and a single device. As this procedure is highly operator-dependent, this could remove the inter-observer bias. Besides, to the best of our knowledge, this is the first cross-sectional study comparing the results of biliary tract ultrasonography and ERCP findings. The main limitation of this study was the researchers' lack of access to demographic data, as addicts are normally reluctant to be interviewed.

Conclusion

Opium used by addicts has varying degrees of impurity. It can be concluded that higher purity in opium can induce more CBD dilatation (as indicated by either ERCP or ultrasonography), although further investigations are recommended.

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