Does Ingestion of Tincture of Opium Notably Raise Blood Alcohol Concentration?

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Abstract

\textbf{Background:} Tincture of opium (TOP) is currently used for maintenance therapy in treatment of opioids addiction. It contains ethanol. The present study was conducted to assess the increase in blood alcohol concentration (BAC) in its users; a process which may interfere with breath-alcohol test performed by law enforcement or traffic police.

\textbf{Methods:} A total of 143 individuals were selected randomly from drug users who had been referred to an addiction treatment clinic. They were asked to undergo breath-alcohol test 15, 30, 45, and 60 min after taking their daily dosage of TOP. The resulting figures were statistically analyzed by t-test and chi-square test using SPSS for Windows.

\textbf{Findings:} The calculated blood ethanol concentration rose to 26.33 \pm 14.34, 29.15 \pm 6.70, and 33.03 \pm 8.46 in persons taking 20, 25, and 30 ml TOP respectively, 5 min after their drug ingestion. The figures turned into zero after 15 min.

\textbf{Conclusion:} Users of TOP should be reassured about its alcoholic content. Its alcoholic content cannot produce equilibrium disturbance or notable BAC. However, it is recommended that users of TOP are observed in addiction treatment centers for 15 min after taking their drug to reach a higher degree of certainty about any effect of alcoholic content of TOP.

\textbf{Keywords:} Addiction, Treatment, Tincture of opium, Ethanol


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**Introduction**

Over the past two decades, global drug use has been a very challenging public health concern. Iran is one of the countries that is highly affected by drug use; 2 million (2.8%) of its 70 million population use opiates.\(^1\) Having long borders with Afghanistan; the major worldwide opium producer for the past 25 years;\(^2\) has resulted in large-scale drug trafficking and marketing in and out of Iran. In addition, opium smoking has a deep cultural root in some Iranian communities and families resulting in relative social tolerance towards opium smoking even in the presence of family members and friends.\(^1\)

Opium (sumo in Greek) is a dried extract obtained by evaporation and heating of the latex from incision of the capsules of non-ripe Papaver somniferum (Papaveraceae), known popularly as Oriental poppy.\(^3\) Iran has one of the highest rates of opioids abuse in the world.\(^1\) Harm reduction programs are followed by Iranian Ministry of Health. There were more than 1600 drug clinics mostly run by private and non-governmental organizations, providing different pharmacological and non-pharmacological treatments to nearly 432000 patients in 2009; mainly maintenance therapy.\(^1\) A primary objective of maintenance treatment for opioids dependence is to achieve adequate suppression of withdrawal, without causing unacceptable side-effects.\(^4\)

Globally, methadone is the principal pharmacotherapy utilized in the treatment of opioids dependence. However, in some parts of Asia the cost of methadone and cultural issues are barriers to its widespread use. Hence, there is a need to investigate alternative opioids pharmacotherapy that will be both locally acceptable and effective in the treatment of opioids dependence. One such alternative is tincture of opium (TOP).

The TOP used currently was first introduced by Paracelsus (1490-1540), and Le Mort created the camphorated TOP known as paregoric elixir in 1702.\(^5\) TOP, which is used in some Asian countries for the management of opioids withdrawal and less commonly, as a maintenance treatment.\(^4\) This is a preparation of opium in alcohol and water that in pharmaceutical preparation is standardized to contain 1% morphine. TOP is perceived to be a traditional medicine in some parts of Asia and so appears to be culturally acceptable, and its low cost is an added advantage over methadone.\(^4\) It is also used in neonatal abstinence syndrome in infants born from opioid addicted mothers.\(^5,6\) In 2006, opium tincture (i.e., a liquid form of opium prepared in an alcohol-based solution) was pilot tested as an alternative maintenance treatment strategy for opioids dependents in limited number of clinics in Iran.\(^1\)

But, may ethanol content of TOP interfere with tests for ethanol use? Ethanol use is strongly prohibited in Iran; according to the law and religion. Iranian law enforcement police may examine selected drivers or detainees for ethanol use under certain circumstances; usually using breath-alcohol test. If any person uses TOP prescribed by an addiction treatment clinic, will it result in positive breath-alcohol test? Present study was conducted to answer this question experimentally.

**Methods**

A total of 143 individuals were selected randomly from drug users who had been referred to an addiction treatment clinic, Arak city, Iran during March 2013. They were treating with TOP, according to TOP treatment protocol written by Iranian Ministry of Health (version 2012). They were taking 20, 25, or 30 ml TOP (contained 1% morphine and 20% ethanol, as cited by its producer; Darou pakhsh Co., Iran) daily. They provided informed consent to the authors for participation to the study. They were asked to undergo breath-alcohol test 15, 30, 45, and 60 min after taking their daily dosage of TOP. Breath-alcohol test was performed using a portable breathe tester which its range of alcohol detection was 0.000-0.600 blood alcohol concentration (BAC) and its sensitivity was 0.005-0.100 ± 5% for 0.100-0.400 BAC. The test was performed and BAC was calculated according to the manufacturer recommendations.

The resulting figures were statistically analyzed by t-test and chi-square test using SPSS for Windows (version 16, SPSS Inc., Chicago, IL, USA).

**Results**

A total of 108 persons completed the study. They were categorized based on their TOP dose (A: 20 cc, B: 25 cc, and C: 30 cc). Thirty seven percent of
the studied individuals were placed in group B. Groups A and C comprised 33.3% and 29.7% of the studied persons.

All of the studied individuals had negative breath-alcohol test before taking their daily dose of TOP at the start of the study. Calculated BAC in the studied persons; based on their breath-alcohol test was shown in table 1. Differences between groups were statistically significant 5 and 10 min after TOP ingestion; based on ANOVA test (P-values were 0.030 and 0.001 respectively).

All of the studied individuals were examined for any equilibrium disturbance by one of the authors. None of them had any disturbance.

**Discussion**

Among important activities for addiction prevention and therapy is implementation of maintenance treatment. Maintenance treatments are done through methadone, buprenorphine, and TOP. Opium tincture is a solution of 10 g morphine in one liter liquid containing 20% alcohol. Since 2011, distribution of tincture-opium was begun in Iran.7

Few studies have investigated the side-effects of TOP in the management of opioids dependence and/or opioids withdrawal.4 Dahmardehei and Rafaiee believe that TOP is intolerable by some persons. Its alcohol content is claimed to be cause of 13% of patient's refusal of the drug.7 Alcohol use is prohibited in Islam religion. However, in some pharmaceutical formulations such as elixirs of acetaminophen and diphenhydramine, some percent of ethanol is used due to the low solubility of these compounds. Furthermore, its use during reckless driving or doing offences has penal retribution. The present study was conducted to track possible change of BAC after ingestion of TOP.

The pharmacokinetics of ethanol after typical doses is described by one-compartment model with concentration-dependent elimination. The volume of distribution estimated from blood concentrations is about 37 L/70 kg. Elimination is principally by metabolism in the liver with small amounts excreted in the breath, urine, and sweat.8 Breath-alcohol instruments are widely used for testing alcohol-impaired drivers both at the roadside for orientation purposes (screening tests) and also for evidential purposes when the results are used for prosecution.9

Results of current study showed that ingestion of TOP may increase BAC up to 84 mg/dl. The response is greater when the higher doses of TOP are ingested. However, the response is temporary. The BAC will turn into zero quickly. Moreover, none of the studied persons showed equilibrium disturbance.

We did not find any related study to compare with present study. However, we attain valuable conclusions.

**Conclusion**

Users of TOP should be reassured about its alcoholic content. Its alcoholic content cannot produce equilibrium disturbance or notable BAC. However, it is recommended that users of TOP are observed in addiction treatment centers for 15 min after taking their drug to reach a higher degree of certainty about any effect of alcoholic content of TOP.

**Conflict of Interests**

The Authors have no conflict of interest.
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References

آیا مصرف تنتر اپیوم (شربت تربیاک) غلظت خونی الكل را به میزان قابل توجهی بالا می‌برد؟

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چکیده:
مقیده‌ها: محققان تنتر اپیوم به عنوان یکی از داروهای رایج در درمان نگهدارنده برای معالجه معتادین به اپیومها در کشور مصرف می‌شود. این دارو حاوی انوانی است. مطالعه خاصی در جهت طراحی شده که مشخص نماید آگر مصرف کننده این دارو به هر دلیل توسط پیس تحت آزمایش مصرف الکل توسط دستگاه‌ها کلی متفاوت قرار گیرد، آیا ممکن است نتیجه آزمایش اگر مشترک؟

روش‌ها: 143 مراجعه کننده بکر مرکز درمان نگهدارنده معتادین به صورت تصادفی انتخاب شدند و پس از اخذ رضایت اگاهی جهت شرکت در مطالعه، به وسیله الکل سنج تنفسی ارائه شدند. 60 دقیقه پس از خوردن دوز روزانه تنتر اپیوم خود تحت آزمایش قرار گرفتند. نتایج به وسیله آزمون‌های t و 1/2 توسط نرم‌افزار SPSS مورد تنظیم و تحلیل قرار گرفت.

یافته‌ها: 5 دقیقه پس از مصرف 70، 45 و 0 میلی لیتر تنتر اپیوم، سطح محاسبه‌انل خون به ترتیب به 1/3/4 ± 0/15/15 در ۲۰/۶۸±۴/۲۰ میلی گرم در دمی‌بین تا ۱۵ دقیقه پس از خوردن دوز در مرکز تحت نظر قرار گیرد. میزان گلیمین و انتخابی در این خصوص حاصل شد.

واژگان کلیدی: اعتیاد، دمن، تنتر اپیوم (شربت تربیاک)، انتخاب

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