

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

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## Original Article

### Abstract

**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.

**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.

**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.

**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.

**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.<sup>1</sup> Having long borders with Afghanistan; the major worldwide opium producer for the past 25 years;<sup>2</sup> 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.<sup>1</sup>

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.<sup>3</sup> Iran has one of the highest rates of opioids abuse in the world.<sup>1</sup> 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.<sup>1</sup> A primary objective of maintenance treatment for opioids dependence is to achieve adequate suppression of withdrawal, without causing unacceptable side-effects.<sup>4</sup>

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.<sup>3</sup> TOP, which is used in some Asian countries for the management of opioids withdrawal and less commonly, as a maintenance treatment.<sup>4</sup> 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.<sup>4</sup> It is also used in neonatal abstinence syndrome in infants born from opioid addicted mothers.<sup>5,6</sup> 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.<sup>1</sup>

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, 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

**Table 1.** Calculated blood ethanol concentration (mg/dl) in the studied groups 5, 10, and 15 min after tincture of opium ingestion

Time of the test	Group	Mean $\pm$ SD (range)
5 min after taking TOP	Group A	26.33 $\pm$ 14.34 (10-84)
	Group B	29.15 $\pm$ 6.70 (15-52)
	Group C	33.03 $\pm$ 8.46 (16-49)
10 min after taking TOP	Group A	2.52 $\pm$ 0.86 (0-10)
	Group B	2.21 $\pm$ 0.35 (0-14)
	Group C	4.14 $\pm$ 3.65 (0-12)
15 min after taking TOP	Group A	0.00
	Group B	0.00
	Group C	0.00

TOP: Tincture of opium; SD: Standard deviation

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.<sup>7</sup>

Few studies have investigated the side-effects of TOP in the management of opioids dependence and/or opioids withdrawal.<sup>4</sup> Dahmardehei and Rafeiee 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.<sup>7</sup> 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.<sup>8</sup> 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.<sup>9</sup>

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.

## Acknowledgements

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## آیا مصرف تنتور اپیوم (شربت تریاک) غلظت خونی الکل را به میزان قابل توجهی بالا می‌برد؟

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### مقاله پژوهشی

#### چکیده

**مقدمه:** هم‌اکنون تنتور اپیوم به عنوان یکی از داروهای رایج در درمان نگهدارنده برای معالجه معتادین به اپیوئیدها در کشور مصرف می‌شود. این دارو حاوی اتانول است. مطالعه حاضر بدین جهت طراحی شد که مشخص نماید اگر مصرف کننده این دارو به هر دلیلی توسط پلیس تحت آزمایش مصرف الکل توسط دستگاه الکل‌سنج تنفسی قرار گیرد، آیا ممکن است نتیجه آزمایش او مثبت شود؟

**روش‌ها:** ۱۴۳ مراجعه کننده به یک مرکز درمان نگهدارنده معتادین به صورت تصادفی انتخاب شدند و پس از اخذ رضایت آگاهانه جهت مشارکت در مطالعه، به وسیله الکل‌سنج تنفسی ۱۵، ۳۰، ۴۵ و ۶۰ دقیقه پس از خوردن دوز روزانه تنتور اپیوم خود تحت آزمایش قرار گرفتند. نتایج به وسیله آزمون‌های  $t$  و  $\chi^2$  و توسط نرم‌افزار SPSS مورد تجزیه و تحلیل قرار گرفت.

**یافته‌ها:** ۵ دقیقه پس از مصرف ۲۰، ۲۵ و ۳۰ میلی‌لیتر تنتور اپیوم، سطح محاسبه اتانول خون به ترتیب به  $۱۴/۳۴ \pm ۲۶/۳۳$ ،  $۶/۷۰ \pm ۲۹/۱۵$  و  $۸/۴۶ \pm ۳۳/۰۳$  میلی‌گرم در دسی‌لیتر افزایش یافت. این مقادیر ۱۵ دقیقه پس از مصرف دارو به صفر رسید.

**نتیجه‌گیری:** باید در خصوص محتوای الکلی داروی تنتور اپیوم به مصرف کنندگان آن اطمینان خاطر داد. الکل موجود در دارو باعث مستی یا افزایش قابل توجه سطح خونی الکل نمی‌گردد. با این وجود توصیه می‌شود مصرف کنندگان دارو در هنگام مراجعه به مراکز ترک اعتیاد به مدت ۱۵ دقیقه پس از خوردن داروی خود در مرکز تحت نظر قرار گیرند تا اطمینان بیشتری در این خصوص حاصل شود.

**واژگان کلیدی:** اعتیاد، درمان، تنتور اپیوم (شربت تریاک)، اتانول

**ارجاع:** صلحی حسن، صادقی سده بهمن، امامی پردیس، جمالیان محمد، کاظمی فر امیر محمد. آیا مصرف تنتور اپیوم (شربت تریاک) غلظت خونی الکل را به میزان قابل توجهی بالا می‌برد؟ مجله اعتیاد و سلامت ۱۳۹۳؛ ۶ (۳-۴): ۱۰۴-۱۰۰.

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