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Lead Serum Levels in Opium-Dependent Individuals

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Abstract

Background: Drug abuse, especially opium abuse, is a major public health problem in Iran. Recent reports suggest that opium sellers cheat their customers by adding lead to the opium. Contaminated opium can threaten the health of consumers. The present study aimed to compare the serum level of lead between opium dependents and a control group.

Methods: This was a cross-sectional study in which 50 opium dependents aged 20 to 60 years old were compared with a control group of 43 non-dependents who were matched with the case group in terms of sex and age. The serum level of lead and liver function tests including serum total bilirubin, AST, ALT, Alkaline-phosphatase and hemoglobin were measured for all subjects.

Findings: The mean level of serum lead concentration in opium dependents and controls was 3929.358 ± 147.67 and 3532.721 ± 1141.53, respectively and the difference was not statistically significant. There was no significant correlation between serum level of lead and age, duration of opium dependency, serum total bilirubin, hemoglobin, AST, ALT, and Alkaline-phosphate.

Conclusion: Although there was no significant relationship between opium consumption and serum level of lead, the concentration of lead in dependents' serum was higher than controls. Further studies are needed to approve this relationship to be used for screening and on time diagnosis of opium dependents.

Key words: **Opium, Addiction, Lead poisoning, Serum level.**

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Introduction

Drug abuse is a major problem of public health in all societies including Iran. Opium and its' derivatives are the most common drug consumed in Iran.[1, 2] The prevalence of opiate-dependency is 1-2 percent in the world. But it seems that prevalence of opium addiction in Iran is much higher than the world and a high prevalence of 22% in some rural areas are reported.[3]

Several studies report symptoms and disorders such as abdominal pain, anemia and nephropathy in drug addicts.[4-6] Other reports associate these symptoms and disorders to the lead added to opium. In other words, most drug sellers add lead to opium to increase the weight.[6] Most complications of lead poisoning is related to its interference with vital elements and factors especially calcium, enzymes and other proteins.

In Massodi et al study in Iran, the existence of lead in opium was approved.[6] In the study of Aghaee-Afshar et al in 2008 also concentration of lead in 10 samples of opium used in the study was high.[5] In some other reports also, poisoning with lead in opium users are reported. Decreased level of consciousness, abdominal pain and even paralysis of four limbs in one case has been reported in consumers of opium.[6-8]

It is possible that the consumption of lead-contaminated opium increase the serum level of lead. However, there has been no study on those with no symptoms of poisoning and most existed studies measured the serum level of lead in poisoned people. Therefore, considering the high prevalence of opium dependency in Iran and also considering the complications and terrible outcomes of increase in serum level of lead in body, this study compared the serum level of lead in two groups of dependents to opium and non-dependent individuals.

Methods

In this cross-sectional study, 50 opium dependents in the age range of 20 to 60 years were compared with 43 non-dependents. The two groups were matched in age and gender. Dependency diagnosis was based on SDM-IV criteria.[9] Opium was consumed by inhaling in all cases. To approve non-dependency of the controls, urine test was done. Then, 10 cc blood was taken from all participants. Blood samples were collected in glass tubes and serum was separated by centrifuge and lead concentration in serum was measured by an atomic absorption of Buck Scientific made in the US and by an experienced staff in a laboratory. Also, liver function tests including AST, ALT, serum total bilirubin, Alkaline-phosphatase and hemoglobin were measured for all subjects.

Data were analyzed using SPSS[17] software. To compare the mean level of lead in the two groups and between the two sexes, student t-test was used. To assess the correlation of lead level with other quantitative variables, Pearson's correlation coefficient was used and a p value lower than 0.05 was considered significant. The power of statistical test was considered equal to 80%.

Results

The total number of people in the study was 93, including 50 opium dependents and 43 non-dependents. The mean age of opium dependents and controls were 22.18 ± 39.74 and 25.17 ± 40.03 years, respectively. Out of total participants, 27 were female and the rest were male. The number of females was 16 and 13 in dependent and control groups respectively and the difference was not statistically significant.

The mean level of serum lead concentration in opium dependent and control groups was 3929.358 ± 147.67 and 3532.721 ± 1141.53 µg/dl, respectively and the difference was not statistically significant. There was no significant correlation between serum level of lead and age, duration of opium dependency, serum total bilirubin, hemoglobin, AST, ALT, and Alkaline-Phosphate serum levels (Table 1).

Table 1. Correlation between serum level of lead and other variables

variable	Pearson's correlation coefficient	p-value
Age	0.03	0.73
Duration of opium abuse	-0.014	0.91
Hemoglobin	-0.20	0.14
total bilirubin	-0.009	0.95
ALT	-0.18	0.19
AST	-0.20	0.16
Alk-P	-0.22	0.11

Discussion

The present study aimed to compare the serum level of lead in opium dependents with a control group. As mentioned in the results, although the serum level of lead in dependents was higher than controls, the difference was not significant.

Aghaei Afshar et al reported the existence of lead in opium samples.[5] Their study approved the contamination of opium with lead in the products offered in market. Other studies also have reported poisoning with lead after consuming contaminated opium and heroin.[6, 8, 10, 11] Most of these studies are reports of poisoning with lead and a wide range of symptoms following consumption of contaminated opium and heroin. However, none of these studies compare the serum level of lead in drug dependents with non-dependents.

In the study of Salehi et al in 2009, the serum level of lead in opium dependents was significantly higher than controls. Also, there was a significant correlation between the amount of consumed opium and serum level of lead.[12] In the present study, although the serum level of lead in dependents were higher than controls, the difference was not significant. This result can be related to small size of study sample. In Salehi et al study, also like the present study, no correlation was found between the duration of opium consumption and serum level of lead. This result can be due to the short half life of lead in blood which is 36 days.[12]

The source of opium contamination with lead is not definite. It is probable that drug producers and sellers add some lead to the opium to increase the weight and make more money. The existence of lead in opium can lead to complications such as severe poisoning, decreased level of consciousness, digestion complications and even paralysis. Therefore, it may be necessary to consider poisoning with lead as one of differential diagnosis for those opium abusers who refer to emergency rooms with poisoning symptoms.

Conflict of interest: The Authors have no conflict of interest.

Conclusion

Small sample size and not investigating the history of cigarette smoking are limitations that can have effect on the results of the present study. In the present study, the daily amounts of opium consumption for the subjects were not assessed. It is possible that the little amount of opium consumption does not increase serum level of lead and a special amount is needed to increase the lead level in blood and cause poisoning. Therefore, further studies are recommended on the topic measurement of the amount of opium consumed or measure the amount of morphine in urine to get more precise results. Another factor that may affect the results of the present study is the method of consuming opium. In this study, all the subjects were consuming opium by inhaling. The heat of smoking opium can affect the amount of lead absorbed in blood while other methods of consumption, such as oral consumption, may have not that much effect on the opium lead and the blood absorption of lead can be higher in these methods. Therefore, since there are few studies on this topic, further studies with bigger sample size are recommended on the correlation between these variables, so that if needed, opium dependents undergo screening and diagnosis actions on time.

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مقاله پژوهشی

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مقایسه سطح سرمی سرب در افراد وابسته به تریاک با گروه شاهد

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چکیده

مقدمه: سوء مصرف مواد مخدر و به خصوص تریاک از مشکلات عمده بهداشت عمومی در ایران به شمار می‌رود. یکی از تقلباتی که توسط فروشندگان تریاک صورت می‌گیرد، اضافه کردن سرب به آن جهت سنگین شدن وزن و دریافت سود بیشتر می‌باشد. مصرف تریاک آلوده با سرب می‌تواند اثرات سویی بر سلامت مصرف کنندگان داشته باشد. هدف از مطالعه حاضر مقایسه سطح سرمی سرب در افراد وابسته به تریاک در مقایسه با گروه شاهد بود.

روش‌ها: در این مطالعه مقطعی، 50 نفر فرد وابسته به تریاک در رده سنی 20 تا 60 سال با 43 نفر فرد غیر وابسته تحت مطالعه قرار گرفتند. دو گروه از نظر توزیع سنی و جنسی همسان سازی شدند. غلظت سرمی سرب و همچنین تست‌های عملکرد کبدی (بیلی‌روبین توتال، ALT، AST و آلکالین فسفاتاز) و هموگلوبین نیز سنجیده شد.

یافته‌ها: میانگین سطح سرمی سرب در گروه وابسته به تریاک 1473/67 ± 3929/358 و در گروه شاهد 1141/53 ± 3532/721 میکروگرم/لیتر بود که از نظر آماری معنی‌دار نبود. بین سطح سرمی سرب و متغیرهای سن، مدت زمان اعتیاد، بیلی‌روبین توتال سرم، هموگلوبین، ALT، AST و آلکالین فسفاتاز سرم همبستگی معنی‌داری مشاهده نشد.

نتیجه‌گیری: در این مطالعه اگرچه بین مصرف تریاک و سطح سرمی سرب ارتباط معنی‌داری پیدا نشد، اما سطح سرمی سرب در افراد وابسته بالاتر بود. توصیه می‌شود که جهت تأیید وجود یا عدم وجود این رابطه مطالعات بیشتری انجام شود تا در صور ت نیاز اقدامات غربالگری و تشخیصی به موقع در افراد مصرف کننده به کار بسته شود.

واژگان کلیدی: تریاک، اعتیاد، مسمومیت با سرب، سطح سرمی.

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