Detection of Drugs of Abuse among Drivers in Fayoum City/ Egypt

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Abstract	
	Background: There is growing interest in the part played by drugs in traffic accidents all over the world and in how to explore sufficient measures to decrease their rate. The aim of the study is to identify types of substance of abuse among drivers in Fayoum city.**Aim of the work:** To identify types of substance of abuse among drivers in Fayoum city.

Methods: The current study was done on 200 drivers in Fayoum city. The screened drugs were cannabis, benzodiazepine, morphine and tramadol. All samples are screened by dip stick to detect studied types of drugs at forensic lab.at Fayoum University and positive samples were confirmed by gas chromatography (G.C) at poisoning center, Ain shams university.

Results: The present study showed that 21.5% (n=43) of study group were drug abusers, 11.5% (n=23) were Tramadol abusers, 6.5% (n=13) of drivers were tetrahydrocannabinol (THC) abusers, and 3.5 % (n=7) THC and Tramadol abusers, on the other hand no one was morphine or benzodiazepine abusers. The present study demonstrated that among tramadol samples 34 samples were positive by dip stick, versus 30 samples were positive by G.C. The current study showed that among THC samples 22 samples were positive by dip stick versus 20 samples only were positive by G.C. **Conclusion**: about one fourth of the drivers were drug abusers. Tramadol and THC were the commonly abused drugs while there were no abusers for morphine and benzodiazepine. **Recommendations:**

Drug screening should be added to all forms of basic toxicological screening especially to those involved in acts of violence and traffic accidents and for all drivers applying for license. Also using dip stick to check for drug abuse among drivers in check points being easy and rapid method with high accuracy

Introduction

Drug misuse is increasing around the world; a large number of people are reported to be users of cocaine, amphetamine-like stimulants, and other new medications (Cone, 2001). The commonest groups of these drugs are synthetic cannabinoids which are known as recreational medications or creator drugs (Al-Saffar et al, 2013).

There is growing interest in the part played by drugs in traffic accidents all over the world and in how to explore sufficient measures to decrease their rate (Avarez et al, 2007). Most drugs that affect the focal sensory system can possibly debilitate driving capacity. Alcohol, drugs of abuse (DOA: opiates, amphetamines, cocaine and cannabis) and prescribed psychoactive drugs are potentially concerned. For a long time, consideration has basically focused on alcohol and most countries have built up legal limits for blood alcohol concentration during driving. However during last years, drugs other than alcohol have showed a marked increase of use (Huestis, 2002).

In Egypt, drug dependence is viewed as one of the critical problems that worry both residents and government authorities. It affects youth in their productive years and may lead to many problems such as social maladaptation, decreased work productivity and job loss (El Akabawi, 2001).

Subjects and Methods

Subjects

The current study was done on 200 drivers in Fayoum City. Samples were collected from car stations in a period of 3 months (February, March, April) in the year of 2016. Every one filled a complete written consent and a questionnaire before collection of samples. Confidentiality of records was kept. The screened drugs were cannabis, benzodiazepine, morphine and tramadol.

Samples collection

Urine samples (usually 10-50 ml from each driver) were collected from drivers in plastic containers, transferred to lab in ice boxes and free zed in (-20ºC) until analysis. The samples were collected in front of guardian to avoid dilution of the samples. . Each sample took a serial number in view of the drivers.

Samples analysis

Screening: All samples were screened by dip stick to detect studied types of drugs at forensic lab at Fayoum University

Confirmatory: positive samples were confirmed by G.C at poisoning center, Ain Shams University.

(1) Dip stick

Principle of use of dip stick to examine urine sample before extraction:-

It is an immunoassay based on the principle of competitive binding. Drug which present in the urine specimen compete against their respective drug conjugate for binding sites on their specific antibody. During testing, a urine specimen migrates upward by capillary action.

Results

Negative: - A colored line in the control line region(C) and a colored line in the test line region (T) for a specific drug indicate a negative result. This indicates that the drug concentration in the urine specimen is below the designated cut- off level for that specific drug. The shade of color in the test region (T) may vary, but it should be considered negative whenever there is even a faint colored line.

Positive: - A colored line in the control line region (C) but no line in the test line region (T) for a specific drug indicates a positive result. This indicates that the drug concentration in the urine specimen exceeds the designated cut-off for that specific drug.

Invalid: - Control line fails to appear due to insufficient volume or incorrect procedural techniques .These are the most likely reasons for line failure.

(3) Gas chromatography:

Instrument: Dani
Type of column :C18
Carrier gas: Helium
Flow rate: 1 ml/ min
Injection volume: 1 micro

Detector: flame ionization detector FID
Retention time: time of standard peak start from time of injection to time of appearance of peak.

Method of extraction

2 ml urine + 5 ml dichloromethane then vortex for 10 minutes then centrifuge. Aqueous part is discarded and solvent is evaporated then reconstitution with 50 micro methanol. Reagents used are G.C grade.

Results

The current study is done on 200 drivers in Fayoum City. Samples were collected from car stations in a period of 3 months (February, March, may) in the year of 2016. The screened drugs were cannabis, benzodiazepine, morphine, and tramadol.

The age of the drivers in the current study ranged between 20- 50 years. The present study shows that 21.5% (n=43) of study group are drug abusers, 11.5% (n=23) were Tramadol abusers, 6.5% (n=13) of drivers were THC abusers, and 3.5 % (n=7) were THC and Tramadol abusers. On the other hand no one abuse morphine or benzodiazepine as shown in figure 1.

The current study showed that there was statistical significance difference (p-value <0.05) in distribution of age and residence among Tramadol abusers with majority of positive cases aged below 35 years old (21% in comparison with 9% for age group from 36-50 years old) as shown in table 1.

The present study showed that there was a statistical significance difference (p-value <0.05) in distribution of age and residence among THC abusers with majority of positive cases were inhabitant rural areas (15% in comparison with 5% in urban areas) as shown in table 2.

The current study illustrated that 58.3% of positive cases take drugs to withstand work conditions, 50% of them take it for sexual issues, 38.9% take it due to presence of psychological problems and stresses, and finally 36.1% of them take it for curiosity as shown in table 3.

The present study demonstrates that among tramadol samples 34 samples were positive by dip stick, versus 30 samples were positive by G.C, as shown in table 4 and 5.

The current study showed that among THC samples 22 samples were positive by dip stick versus 20 samples only were positive by GC as shown in table 6and 7.

Table 1: statistical analysis (chi-square test) of distribution of age and residence among tramadol abusers

Tramadol	Tramadol addiction (n=200)		p-value	Sig.
	Negative	**Positive**		
Residence				
Urban	79(46.5%)	16(53.3%)	0.6	N.S
Rural	91(53.5%)	14(46.7%)		
Age group				
20-35 yrs	85(50%)	21(70%)	0.04*	S
35-50 yrs	85(50%)	9(30%)		
P value >0.05= non-significant, <0.05= significant., <0.001= highly significant, N.S = non significant, S = significant				

Table 2: statistical analysis (chi-square test) of distribution of age and residence among THC abuser

THC	THC addiction (n=200)		p-value	Sig.
	Negative	**Positive**		
Residence				
Urban	90(50%)	5(25%)	**0.03***	**S.**
Rural	90(50%)	**15 (75%)**		
Age group				
20-35 yrs	92(51.1%)	14(70%)	0.2	N.S
35-50 yrs	88(48.9%)	6(30%)		

Table 3: Motivations for drug abuse among study group.

Variables	**Number** (n=36)	**%**
Curiosity	14	36.1%
Withstanding work conditions	21	58.3%
Sexual issues	18	50%
Psychological problems and stresses	13	38.9%

Table 4: Dip stick results of tramadol among study group

Variables	Tramadol (n=200)	
	No.	**%**
Negative	166	83%
Positive	34	17%
Total	**200**	**100%**

Table 5: G.C results of tramadol among study group.

Variables	G.C results of Tramadol (n=34)	
	No.	%
Negative	4	12%
Positive	30	88%
Total	34	100%

Table 6: Dip stick results of THC among study group.

Variables	THC (n=200)	
	No.	**%**
Negative	178	89%
Positive	22	11%
Total	200	100%

Table 7: G.C results of THC among study group.

Variables	THC (n=200)	
	No.	**%**
Negative	178	89%
Positive	22	11%
Total	200	100%
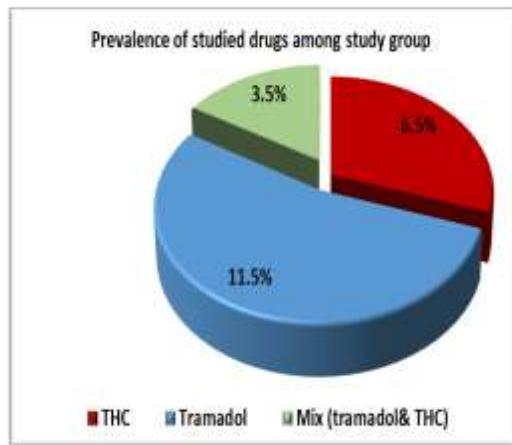
Figure 1: prevalence of studied drugs among study group (Qui square test is used)

Discussion

Driving under the influence of drugs (DUID) is also an emerging public health and traffic safety concern (Hayman and Crandall, 2009). Egypt has one of the highest death rates due to road accidents and tramadol abuse is associated with 18.7% of these accidents (Fawzy etal, 2010). A recent government investigation of 1800 truck and microbus drivers found that 200 (11%) of them were regular users of drugs during working hours (Bassiony etal, 2015).

The present study was the first study conducted in fayoum governorate on drug abuse among drivers disscussing prevalence of drug abuse and prevelence of commen types of drug abuse among drivers in fayoum city(tramadol, cannabis,morphine and benzodiazepines) . In the current study cannabis abuse was distributed among all age groups (20-50) and it is more common in rural than urban areas. Distribution of cannabis in rural areas more than urban areas may be explained by the wide spread of cannabis abuse in Egyptian weddings of rural areas .This was consistent with WHO report which stated that cannabis abusers are found in all age groups and social strata. Special target groups are adult smokers in rural areas of Africa and Eastern Mediterranean (EMCDDA, 2004). The result of the current study is not

consistent with a study conducted on public roads in Spain in 2015 which reported that the highest prevalence of positive results for cannabis (15.2%) was found in the younger age group (18-24 years), cannabis were also more frequently observed in urban areas (Domingo-Salvany A et al, 2015).

In the current study tramadol abuse was more frequent in younger age groups (20-35 years) and there is no statistical significance difference in distribution of tramadol between urban and rural areas which indicate widespread of tramadol. The result of our study agrees with the result of a Sweden study which reported that tramadol abuse was more frequent in younger age groups (15-34 years). The explanation may be that drug diversion, substance use disorders, risk-taking behavior, traffic accidents and drug-impaired driving are all more common in the young (Tjäderborn etal, 2016). Also result of the present study is consistent with an American study which reported that the prevalence of nonmedical use of prescriptions opioids was similar among residents in urban and rural counties (Wang et al, 2013). This is not in line with a study conducted among drivers of New Zealand which reported that tramadol was used by all age groups except those over 65 years (Starkey etal, 2017).

In the present study, motivations for drug abuse among drivers were curiosity 36.1%, withstanding work conditions 58.3%, sexual issues 50% and psychological problems and stresses 38.9%. The most common reason of drug abuse in our study was withstanding work conditions. This agreed with the result of another study conducted in Nigeria and stated that desires to work hard and make more income and to relieve stress after a long day work were the major reasons for which drivers engage in substance abuse (Yunusa et al, 2017). These results disagreed with a study conducted in Egypt and showed that Curiosity followed by the desire to make fun was reported as the main motives for drug abuse (ELAkabawi, 2001).

In the current study, among 200 screened drivers tramadol was the most frequently detected drug 11.5%. This agreed with Danish study which stated that among Danish drivers, Diazepam (4.4%), tramadol (3.2%), and clonazepam (3.0%) were the most frequently detected drugs (Simonsen etal., 2013). The widespread of tramadol use in Egypt is due to its availability without prescription, its easy illegal smuggling and its cheap prices and its alleged enhancement of sexual performance (Fawzi, 2011).

Another study was conducted in Egypt and proved that Cannabis was the commonest in all regions. In total, 52.39% of the substance users were using Cannabis (Hamdi etal, 2016). This is not consistent with the result of the current study which proves that tramadol abuse is the commonest abused drug.

In this study Sensitivity and specificity of dipstick in comparison with GC in detection of drug abuse illustrated that G.C was better than dipstick in detection of drug abuse. This agreed with the result of Korean study in which 275 blood samples were taken from Korean drivers positive from November to December of 2011. The study stated that by GC confirmation, methamphetamine (#84768) and benzodiazepine (#85063) in two cases were not detected from the positive blood samples by immunoassay (Kim et al, 2016).

Conclusion
About one fourth of the drivers were drug abusers. Tramadol and THC were the commonly abused drugs while there were no abusers for morphine and benzodiazepine

Recommendations
1-Drug screening should be added to all forms of basic toxicological screening especially to those involved in acts of violence and traffic accidents and for all drivers applying for license.
3-Using dip stick to check for drug abuse among drivers in check points being easy and rapid method with high accuracy.
4-Increase awarness of drivers about effects of drugs during driving and its fatal outcomes.
5- Encouraging a better sleep habits and adjustment of travel schedule and hours of driving may minimize

fatigue and sleepiness and ultimately reduce the desire for drugs during driving.

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الملخص العربي

الكشف عن تعاطي المخدرات بين السائقين في محافظه الفيوم/مصر

غادة مصطفي الجلاد و عمرو عبد الغني عبد الجيد و مي احمد عبد العزيز و سميه حموده السيد

هناك اهتمام متزايد بالدور الذي تلعبه المخدرات في حوادث الطرق في جميع انحاء العالم وكيفية اتخاذ تدابير كافية لتقليل معدلاتها.

الهدف من الدراسة: هوالتعرف علي الانواع المختلفة من المخدرات التي يتعاطاها السائقين.

طريقة الدراسة: اجريت هذه الدراسة علي ٢٠٠ سائق من محافظة الفيوم. المخدرات التي تم البحث عنها هي الحشيش, الترامادول, الافيون, البنزوديازبين. وكانت الخطوة الاولي هي الكشف عن المخدرات في عينات البول باستخدام اشرطة الكشف عن المخدرات يليها خطوه تاكيدية باستخدام جهاز كروماتوغرافيا الغاز وقد خضعت لها جميع العينات الايجابية.

نتائج الدراسة: كشفت الدراسة أن نسبه تعاطي المخدرات بين السائقين في محافظة الفيوم هو ٢١,٥٪ . وكان اكثر المخدرات انتشاراً هو الترامادول بنسبه ١١,٥% . يليه الحشيش بنسبة ٦,٥% في حين بلغ نسبة الحالات التي تتعاطي الحشيش والترامادول معاً ٣,٥%. وكشفت الدراسة انه بخصوص العينات الايجابية للترامادول, ٣٤ عينه كانت ايجابية باستخدام اشرطه الكشف عن المخدرات, بينما ٣٠ عينه فقط كانت ايجابية باستخدام جهاز كروماتوغرافيا الغاز.

اما بالنسبة للعينات الايجابية للحشيش, ٢٢عينه كانت ايجابية باستخدام اشرطة الكشف عن المخدرات, بينما ٢٠ عينه فقط كانت ايجابية باستخدام جهاز كروماتوغرافيا الغاز

الخلاصه: اثبتت الدراسة ان ربع السائقين تقريبا كانوا يتعاطون المخدرات. وكان الترامادول والحشيش هم الاكثر انتشاراً

التوصيات:يجب أن تتم إضافة فحوصات المخدرات إلى جميع أشكال فحص السموم خاصة لأولئك المشاركين في أعمال العنف والحوادث المرورية ولجميع السائقين المتقدمين للترخيص. ايضاً يجب استخدام اشرطة الكشف عن المخدرات للتحقق من تعاطي المخدرات بين السائقين في نقاط التفتيش هي طريقة سهلة وسريعة ودقيقه.

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