Prevalence of substance use among trauma patients treated in a Brazilian emergency room

Prevalência do uso de substâncias em pacientes com traumas em um pronto socorro brasileiro

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Abstract

Objective: Although there is a considerable amount of data in the literature regarding the association between alcohol consumption and injuries treated in emergency rooms, little is known about the relationship between such injury and the use of other substances. The objective of this study was to estimate the prevalence of substance use in patients admitted to the emergency room for non-fatal injuries. *Method:* A prospective cross-sectional study assessing all patients admitted to the emergency room within 6 hours after a non-fatal injury was conducted over a three-month period. The following were used as measures of alcohol and drug use: a standardized World Health Organization questionnaire; a self-administered questionnaire related to drug consumption within the 24 hours preceding contact; the Drug Abuse Screening Test; urine screens for cannabis, cocaine and benzodiazepines; and determination of blood alcohol concentration. Descriptive analyses were performed and the confidence interval used was 95%. *Results:* A total of 353 patients were included. Cannabis and cocaine screens were conducted for 242 patients and benzodiazepine screens were conducted for 166. Blood alcohol concentrations reached the level of positivity in 11% (n = 39), and 10% (n = 33) presented some degree of intoxication. Among the 242 patients screened, 13.6% (n = 33) tested positive for cannabis, and 3.3% (n = 8) tested positive for cocaine, whereas 4.2% (n = 7) of the 166 patients screened tested positive for benzodiazepines. *Conclusions:* Substance use was highly prevalent among these individuals. In this sample, the frequency for the use of cannabis (an illicit drug) was comparable to that of alcohol. More studies are needed in order to characterize such use among Brazilians and to develop proper approaches to such cases, with the aim of reducing substance use and its consequences.

Keywords: Wounds and injuries; Substance-related disorders; Emergency medical services; Epidemiology; Substance abuse detection

Resumo

Objetivo: Ainda que haja significativa literatura sobre a associação entre álcool e trauma, pouco se sabe sobre o uso de outras substâncias e trauma em pronto socorro. O objetivo do estudo foi estimar a prevalência do uso de substâncias em pacientes admitidos em um pronto socorro por trauma não fatal. *Método:* Um estudo prospectivo de corte transversal avaliando todos os pacientes admitidos dentro de 6 horas antes de trauma não fatal em pronto socorro durante um período de três meses. Um questionário padronizado pela Organização Mundial de Saúde, o auto-relato do consumo de drogas nas últimas 24 horas antes do contato; Drug Abuse Screening Test); screening de urina para maconha, cocaína e benzodiazepínicos e Concentração de Álcool no Sangue foram utilizados como medidas de avaliação do uso de álcool e drogas. Foram realizadas análises descritivas e o intervalo de confiança foi de 95%. *Resultados:* Foram incluídos 353 pacientes, tendo sido coletados screenings de maconha e cocaína de 242 pacientes e de 166 pacientes para benzodiazepínicos. A Concentração de Álcool no Sangue foi positiva em 11% (n = 39) e 10% (n = 33) apresentaram algum grau de intoxicação alcoólica. O teste de maconha foi positivo em 13,6% (n = 33); respectivamente de cocaína em 3,3% (n = 8) e de benzodiazepínicos em 4,2% (n = 7). *Conclusões:* O uso de substâncias nesses indivíduos que sofreram trauma é altamente prevalente. Nesta amostra, a freqüência para maconha (uma droga ilícita) esteve próxima ao de álcool. Mais estudos são necessários a fim de identificar a realidade brasileira e elaborar identificações adequadas para estes casos, visando à redução do uso de substâncias e suas conseqüências.

Descritores: Ferimentos e lesões; Transtornos relacionados ao uso de substâncias; Serviços médicos de emergência; Epidemiologia; Detecção do abuso de substâncias

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Introduction

There is a considerable amount of data in the literature regarding the association between alcohol and injuries treated in emergency rooms. However, most emergency room (ER) studies involving representative samples of injured patients published in English since 1995 have not taken into account the use of other drugs. Nevertheless, a significant number of reports on alcohol use 6 hours prior to injury have also found that other (illegal) drugs were used during the same 6-hour period, although illicit drug use is not systematically included in every questionnaire.[1]

The combination of alcohol use and the use of other drugs can have a synergistic effect, increasing the likelihood of injury, whether intentional (e.g., self-inflicted or related to violence) or unintentional (e.g., motor vehicle accidents, poisonings, falls, fires and others), causing disability and increasing caseloads worldwide.[1]

Toxicological studies have shown that drug use prevalence varies according to the population studied. In severe injury situations, cannabinoid levels range from 7 to 37%, cocaine levels from 8 to 12% and benzodiazepine (BZD) levels from 4 to 8%. In adolescent populations, however, these levels range from 6% to 7.5% for cannabinoids, 8% for cocaine, 6% for BZDs and 9% for alcohol. In psychiatric patients treated in the ER, the prevalence is even higher when compared with other populations studied, with levels of 12.8% for cannabinoids, 38% for cocaine and 7.6% for BZDs.[2-5]

In Brazil, data on associations between injuries and substance use in ER patients remains limited and specifically focused on alcohol consumption. In 1989, Chaves et al. made observations based on detectable blood alcohol levels in 593 patients, victims of traffic accidents treated in the polytrauma sector of the Porto Alegre Hospital ER and found that 24.5% presented blood alcohol concentrations (BACs) that reached the level of positivity.[6] In another study, also involving victims of traffic accidents, performed in the city of Curitiba in 2000, 42.85% of those assessed presented such BACs.[7] Kerr-Corrêa et al. examined the medical records of 519 patients hospitalized with injuries and found that alcohol abuse/dependence was a factor in 12% of the cases.[8]

Carvalho et al. analyzed the prevalence of detectable blood alcohol levels in 464 victims of road-traffic accidents, aggression or falls admitted to the ER in São Paulo and observed that blood samples tested positive for alcohol in 29% (95% CI: 24.8-33.2).[9]

Data from ER studies could be useful in making policy decisions regarding alcohol and drug use control measures and for prevention and intervention measures to reduce substance-related problems in the ER setting.

The present study aims to estimate the prevalence of alcohol and drug use in patients with non-fatal injuries who were admitted to the ER of a general hospital.

Method

The data analyzed were obtained from an ER in the city of São Paulo. Brazil was one of the countries included in the World Health Organization (WHO) epidemiologic study designated the Collaborative Study on Alcohol and Injuries. The WHO Collaborative Study on Alcohol and Injuries was carried out in 12 ERs in the following countries: Argentina, Belarus, Brazil, Canada, China, the Czech Republic, India, Mexico, Mozambique, New Zealand, South Africa and Sweden.

1. Study design

A prospective cross-sectional study was carried out in the ER of São Paulo Hospital, a university general hospital, situated in the city of São Paulo, Brazil. São Paulo Hospital is a tertiary-care public hospital with 654 beds. It was selected as the locale for this study in order to reduce the selection bias that would have resulted from the selection of a specialized trauma center.

The percentage of patients seeking treatment for injury in São Paulo Hospital is unknown. Of the patients treated on psychiatric wards and required to remain for observation for at least one day, approximately 38% present problems related to alcohol use. As of October 30, 2001, 265,566 patients (150,705 men and 114,861 women) had been seen in the ER of São Paulo Hospital.[10]

2. Sample

All patients who sought ER treatment for non-fatal injuries during two 6-week, 24-hour-a-day, seven-day-a-week data collection periods, over a three-month period (July–September of 2001) were selected. In addition, this study period was intentionally chosen to avoid the months in which large traditional holidays, such as Carnival and the New Year, occur, since the number of accidents related to psychoactive substance use is undoubtedly higher at such times.

Injury was defined as any damage inflicted upon the body as the direct or indirect result of an external force, with or without disruption of structural continuity.

This study design was approved by the Universidade Federal de São Paulo Ethics Committee. Patients were approached immediately after admission to the ER and asked to participate in the study. Prospective participants were presented with an informed consent form explaining the nature of the study and of the subject participation (providing a breath sample to estimate BAC and a urine sample for detecting drug use). Upon giving written informed consent, patients were given a copy of the informed consent form with contact numbers. As soon as possible thereafter, interviews were conducted, breath tests were administered, and urine samples were obtained.

A total of 353 subjects were selected. Of those 353, 22 were excluded for one of the following reasons: 3 for refusing to participate; 12 for being too severely injured to answer the questionnaires; 2 for being too intoxicated; 1 due to communication difficulty; 1 due to death; 1 for leaving the ER before having finished the interview; and 2 due to other causes.

The sample largely comprised males (67%, n = 235), workers (67%, n = 237), and individuals of low or very low income (70%, n = 246). The mean number of years of schooling was 8.5 (SD = 4.6), and the mean age was 35.5 years (SD = 16.5 years) (Table 1).

3. Inclusion and exclusion criteria

For inclusion in this study, patients had to be over 18, have experienced some sort of non-fatal injury occurring less than 6 hours prior to recruitment and be receiving injury care for the first time. We also included patients who were later admitted to the intensive care unit or who became candidates for surgery. Patients returning for check-ups were excluded, as were those who did not give written informed consent to participate in the study.

4. Data collection

Data were collected using a questionnaire that took

Table 1 - Sociodemographic data and screening for drugs. São Paulo, 2001

		N	n	%	IC 95 %	
Gender	Female		118	33.4	28.5	38.3
	Male		235	66.6	61.7	71.5
		353				
Work	Yes		237	67.1	62.2	72.0
	No		97	27.5	22.8	32.2
	Refused		19	5.4	3.0	7.8
Income	Very low		38	10.8	7.6	14.0
	Low		208	58.9	53.8	64.0
	Median		49	13.9	10.3	17.5
	High		20	5.7	3.3	8.1
	Very high		14	4	2.0	6.0
	Refused		24	6.8	4.2	9.4
Urine screenings	THC	242	33	13.6	9.3	17.9
	Cocaine	242	8	3.3	1.0	5.6
	BZD	166	7	4.2	1.1	7.3
DAST		353	53	15	11.3	18.7
BAC	Positive		39	11	7.7	14.3
	Negative		314	89	85.7	92.3

N = total number of cases
n = number cases found to that variable

approximately 25 minutes to complete. The questionnaire was administered by a team of trained interviewers consisting of 11 doctors and psychologists with clinical experience in the field of chemical dependence and health. All members of the team had attended a 3-day training seminar on the application of the instrument conducted in São Paulo by the general coordinator of the study in the 12 countries selected. The team took turns being on duty, and there were therefore always two interviewers present during every 12-hour shift.

Interviewers obtained data pertaining to, but not limited to, the following: demographic characteristics; the condition that had motivated the patient to seek treatment in the ER; patient use of alcohol within the 6 hours preceding the event; the number of drinks consumed (1 drink = 50 ml of pure alcohol) during the 6 hours prior to the injury; and clinical assessment of the level of alcohol intoxication according to the ICD 10 Y91. The code Y91 refers to the "presence of alcohol in blood, level not specified" and is intended to be used in the absence of a BAC measure. The degree of alcohol involvement is determined by level of intoxication: Y91.0 = mild alcohol intoxication; Y91.1 = moderate alcohol intoxication; Y91.2 = severe alcohol intoxication; Y91.3 = very severe alcohol intoxication; and Y91.9 = alcohol involvement, not otherwise specified. Criteria for assessment at each level are based on signs and symptoms such as alcohol on the breath, facial reddening, and conjunctival hyperemia, as well as speech impairment, motor incoordination, loss of attention, mood shift (elation or depression), behavioral response disorders, uncooperativeness and nystagmus.[11]

In order to evaluate illicit drug use, the self-report patient data regarding the ingestion of any type of drug 24 hours before contact were used, and the 20-item Drug Abuse Screening Test (DAST-20) questionnaire was applied in order

to evaluate the extent of the substance use problem.

An electronic breathalyzer (Alco-Sensor III; Intoximeters, St. Louis, MO, USA) was used to estimate BAC. The Alco-Sensor III has been found to present good validity and reliability. The breathalyzer results for the participating patients correlated strongly (r = 0.96) with the results of the blood chemistry analyses. The breathalyzer test was always applied during the first hours of arrival, and, in accordance with a conventional agreement with other countries, the result was considered positive when greater than 4.[12]

The DAST-20 comprises 20 questions related to drug use within the last year. The questions pertain specifically to abuse, dependence, withdrawal (signs and symptoms), social impairment, family relations, legal implications, medical problems and previous treatment. Problem severity was classified on a scale from 0 to 20, scored as follows: 0 = no problem; from 1 to 5 = mild; 6 to 10 = moderate; 11 to 15 = substantial; and 16 to 20 = severe. This scale has been used in several studies having been validated at other countries with good results in concurrent and discriminate validity, but still not in Brazil.[13]

Urine samples were screened for cannabis, cocaine and BZDs. The screening kits, which are rapid, qualitative immunoassays, do not quantify the product in terms of biotransformation of cocaine, cannabis or BZDs in the urine or in terms of the level of intoxication. The detection limits are 2–3 days from the last use of cocaine, 28 days from the last use of cannabis and 1–2 days from the last use of BZDs. The sensitivity is 99%, and the specificity 98%.[14]

The original, 12-country study proposed by the WHO did not include investigation of drug use. At our site, we decided to investigate such use. But unfortunately, the material supplied by Phamatech for identifying cannabis, cocaine and BZDs in urine samples (242 cocaine screening kits; 242 cannabis screening kits; 166 BZD screening kits) arrived just after the beginning of the study. Therefore, these Kits were introduced at different time points.

5. Statistical analyses

Statistical analyses consisted of descriptive analyses of the variables, and the confidence interval used was 95%. The information collected was stored in databases using the Statistical Package for Social Sciences (SPSS) software, version 10.0 (SPSS, Inc., Chicago, IL, USA).

Results
1. Nature of injuries

The most common injury types were as follows: cuts, bites, penetrating wounds or open wounds, seen in 36% of cases (n = 129; 95% CI: 31.5-41.5); bruising, laceration or superficial wounds, seen in 24% (n = 84; 95% CI: 19.4-28.2); and pulled muscles, sprains or dislocations, seen in 21% (n = 74; 95% CI: 16.8-25.2). With regard to how patients became injured, 33% (n = 117; 95% CI: 28.2-38.8) reported that they had hurt themselves by falling or tripping, 17% (n = 61; 95% CI: 13.4-21.2) were stabbed, cut or bit, and 14% (n = 50; 95% CI: 10.6-17.8) had been beaten. The majority of injuries (39%; n = 139; 95% CI: 34.3-44.5) were sustained in the street or on the road, whereas 31% (n = 108; 95% CI: 25.8-35.4) occurred in the workplace, and 17% (n = 61; 95% CI: 25.8-35.4) occurred in the home.

Injuries were sustained more often on weekdays (69%) than on weekends and were also more common during the day (70%) than at night, 43% of the cases occurring between 12:00 and 6:00 pm.

2. Psychoactive substance use screenings

The breathalyzer was used to determine BAC in a sample of 353 patients. The result reached the level of positivity in 11% (n = 39; 95% CI: 7.7-14.3), and approximately 9.3% of the patients (n = 33; 95% CI: 6.3-12.3) presented some degree of alcohol intoxication in the clinical assessment.

Of the 353 patients evaluated, 13.36% (n = 47; 95% CI: 9.8-16.8) reported having consumed alcohol during the 6 hours prior to injury, whereas 86.64% (n = 306) did not. The average amount of pure alcohol consumed within 6 hours prior to injury was 108.1 ml (SD = 161.9).

The cannabis and cocaine screens were applied to the samples collected from 242 of the trauma patients, 13.6% of which (n = 33; 95% CI: 9.3-17.9) tested positive for cannabis, and 3.3% of which (n = 8; 95% CI: 1.0-5.6) tested positive for cocaine. Of the 166 trauma patients screened for BZDs, 4.2% (n = 7; 95% CI: 1.1-7.3) tested positive.

In 27 patients, multiple substances were identified: cannabis combined with BZPs (n = 3); cannabis combined with cocaine (n = 6); alcohol combined with BZDs (n = 1); alcohol combined with cocaine (n = 5); alcohol combined with cannabis (n = 12).

Only 9.9% (n = 35; 95% CI: 6.8-13.0) of the patients interviewed admitted having consumed any type of drug in the 24 hours prior to contact.

The DAST-20 results showed that, of the 353 trauma patients evaluated, 15% (n = 53; 95% CI: 11.3-18.7%) had some degree of drug-related problem.

Discussion

Findings in this study are similar to those reported previously in the international literature.[1-5] Especially in Brazil, ER data is still limited. Such data as there are focus specifically on alcohol consumption and do not address the use of other psychoactive substances.

The most recent and significant epidemiological studies on alcohol consumption in Brazil have demonstrated that the high prevalence of alcohol use clearly has a strong influence on the etiology and maintenance of various social, economic and health problems.[15]

A finding we deem particularly relevant in this study is that 13% of the trauma patients evaluated tested positive for cannabis, a level very close to that of positivity for consumption of alcohol, a legal drug, which stood at 11%. In addition, the most common drug combination was cannabis and alcohol (found in 12 patients). Although is impossible to determine the proximity of the cannabis use, we can speculate that these individuals became more vulnerable to accidents due to the use of multiple substances.

Cannabis use has risen considerably over the past 15 years.[16-17] O'Kane et al. recent reviewed the topic of cannabis use and driving, stressing the fact that studies have shown that cannabis significantly affects driver judgment when used alone, an effect that is augmented when cannabis is combined with alcohol, and stating that, to date, cannabis remains the psychoactive drug most often involved in traffic accidents.[17]

In the first national survey on the use of psychotropic drugs, carried out in 107 Brazilian cities throughout 2001 by the Brazilian Information Center on Psychotropic Drugs, the prevalence of everyday drug use was 19.4% (95% CI: 16.6-22.1), and cannabis was the drug most often cited (6.9%; 95% CI: 5.2-8.6). An additional 3.3% of the sample reported having fallen as a result of using psychotropic substances, and a nearly equal proportion (3%) reported having injured themselves under the same circumstances.[18] Cannabis dependence was reported by 1% of those interviewed, translating to 451,000 individuals. Surprisingly, the southeastern region of Brazil, where the city of São Paulo is located, presented the lowest estimate of cannabis dependency (0.7%), whereas the highest percentage (1.6%) was seen in the southern region.

In the same survey, the lifetime use of alcohol in the southeast region of Brazil was found to be 71.5% and alcohol dependence was found to be 9.2%, whereas BZD dependence was found to be 0.8% and the lifetime use of cocaine was found to be 2.6%.[18]

Some studies have shown that chronic drug use is a decisive factor in increasing the likelihood of ER treatment, such patients using emergency services 30% more frequently than do non-users or "occasional" users.[19] Therefore, efforts ought to be made to adapt ER procedures in order to facilitate the identification of such users upon their first ER visit. However, it is important to note that, even when such a drug test is positive, it does not necessarily indicate abuse or dependence.

On the self-report questionnaire, only 9.9% of the sample admitted having used drugs within the last 24 hours, whereas the DAST-20 identified 15% as having some degree of problem related to substance use. Better techniques for measuring and identifying psychoactive substance use in the ER should be developed and established. Self-reported consumption of alcohol compared to the BAC estimate has been found to be a valid measure in previous ER studies.[1]

The clinical assessment (blood chemistry) of this sample showed that 10% had consumed a significant amount of alcohol; a result that was quite similar to the 11% BAC obtained using the breathalyzer, indicating that the first method can be a useful strategy in the absence of a BAC.

In some developed countries, drug screening is commonly undertaken in patients admitted to the ER when there is suspicion of drug intoxication. Nevertheless, this practice is often questionable given that these tests are costly and may lead to false-negative results when such drugs are used in low doses. Despite some evidence that toxicological screening may be unnecessary or of unproven cost-effectiveness, this appears to be a way, in conjunction with the taking of a clinical history, to promote better identification of these cases in the ER.[19-20]

Although none of the patients refused to be tested or dropped out of the study, one limitation of the present study was fact that we were unable to screen all of the patients in the sample for cannabis, cocaine and BZDs. However, we felt that it was important to perform as many of these tests as possible in order to complement the data collected through the questionnaires.

In general, our data only represent a "picture" of a sample and are not representative of the general population. We chose to exclude those patients who were under 18 years old, a group that warrants the attention of future studies. The exclusion of such patients might have led to an underestimation of the extent of substance use among trauma patients.

Although the ER is a convenient site at which to study the association between of substance use and injury, the findings of this study do not provide a complete understanding of the alcohol and drug injury nexus, nor can the data obtained be generalized beyond injuries treated in the ER.

There is, as yet, no standard of best conduct in Brazilian ERs in cases of injury associated with psychoactive drug use.

Our findings have implications for how public health problems of injury and substance abuse should be taken into consideration in research and emergency patient care protocols. Proper approaches to these cases are important in view of reducing the use of these substances and their consequences.

Conclusions

Substance use is highly prevalent in individuals suffering injury. In this sample, the frequency for cannabis use was near that found for alcohol use.

Since excessive alcohol use is the leading risk factor for injury, it offers the most promising target for injury prevention programs. Brief alcohol interventions in trauma patients have been shown to reduce subsequent alcohol intake and injury recurrence. The economic value of it supports the development of a policy of routine trauma-center screening and the provision of brief interventions for those who screen positive. Identification and referral of ER patients who are abusing alcohol or other drugs provide an opportunity to help patients develop insight into the consequences of their abuse and promote improved health.

Future ER studies should focus on the use of other drugs and injury, using a similar methodology in probability samples of patients treated in the ER. Prospective studies, encompassing more regions of the world, would be ideal. Further studies are needed, mainly in Brazil, in order to allow generalization of the conclusions reported in this study.

Acknowledgements

References

1. Cherpitel CJ, Driggers P. Alcohol and injuries: review of emergency room studies since 1995. A report prepared for the World Health Organization. Proceedings of the Conference: Alcohol and Injury: New Knowledge from Emergency Room Studies; 2005 October 3–6, Berkeley, CA; National Institute on Alcohol and Alcoholism, World Health Organization, Center for Disease Control. United States of America. Available at: http://www.arg.org/ER-Conference.html.
2. McDonald A, Duncan ND, Mitchell DI. Alcohol, cannabis and cocaine usage in patients with trauma injuries. *West Indian Med J*. 1999;48(4):200-2.
3. Carrigan TD, Field H, Illingworth RN, Gaffney P, Hamer DW. Toxicological screening in trauma. *J Accid Emerg Med*. 2000;17(1):33-7.
4. Peden M, van der Spuy J, Smith P, Bautz P. Substance abuse and trauma in Cape Town. *S Afr Med J*. 2000;90(3):251-5.
5. Longo MC, Hunter CE, Lokan RJ, White JM, White MA. The prevalence of alcohol, cannabinoids, benzodiazepines and stimulants amongst injured drivers and their role in driver culpability: part ii: the relationship between drug prevalence and drug concentration, and driver culpability. *Accid Anal Prev*. 2000;32(5):623-32.
6. Chaves AG, Pereira EA, Anicete GC, Ritt AG, Melo ALN, Nunes CA, Souza DB, Spellmeier I, Moesch JM, Tarta L, Pessini R, Lanner SD. Alcoolemia em acidentes de trânsito. *Rev HPS*. 1989;35(1):27-30.
7. Rydygier R, Ribas Filho JM, Czeczko NG, Malafaia O, Silva Junior EA, Baptistela E. Análise da intoxicação alcoólica em vítimas fatais de acidentes de trânsito de Curitiba. *Rev Med Parana*. 2000;58(1):72-80.
8. Kerr-Corrêa F, Inaty S, Rossini R, Boccuto C, D'Barri RAG, Sousa LB. Alcoolismo: associação com hospitalizações por trauma/lesões e doença do aparelho digestivo. *J Bras Psiquiatr*. 1993;42(5):285-9.
9. Gazal-Carvalho C, Carlini-Cotrim B, Silva OA, Sanaia N. Blood alcohol content prevalence among trauma patients seen at a level 1 trauma center. *Rev Saude Publica*. 2002;36(1):47-54.
10. Centro de Processamento de Dados - CPD\DI\UNIFESP. [No patent avaliable].
11. "Clinical Assessment compared to breathalyzer readings in the ER: concordance of ICD-10 Y90 and Y91 codes". A report prepared for the World Health Organization. Proceedings of the Conference: Alcohol and Injury: New Knowledge from Emergency Room Studies; 2005 October 3–6, Berkeley, CA; National Institute on Alcohol and Alcoholism, World Health Organization, Center for Disease Control. - United States of America. Available at: http://www.arg.org/ER-Conference.html.
12. Borges G, Cherpitel C, Mittleman M. Risk of injury after alcohol consumption: a case-crossover study in the emergency department. *Soc Sci Med*. 2004;58(6):1191-200.
13. Maly RC. Early recognition of chemical dependence. *Prim Care*. 1993;20(1):33-50.
14. Exames e Testes do Uso de Drogas. Qualidade de Vida - Sistema de provas rápidas para detectar o consumo de drogas através da urina - [homepage on the Internet], Brazil: Sapiens Vita - Vida com Sabedoria, [updated 2006 March]. Avaliable from: URL: http://www.sapiensvita.com.br/usodrogas.html
15. Galduroz JC, Caetano R. Epidemiology of alcohol use in Brazil. *Rev Bras Psiquiatr*. 2004;26 Suppl 1:S3-6.
16. Menetrey A, Augsburger M, Giroud C, Mangin P. Cannabis and automobile driving. *Schweiz Rundsch Med Prax*. 2001;90(34):1398-407.
17. O'Kane CJ, Tutt DC, Bauer LA. Cannabis and driving: a new perspective. *Emerg Med* (Fremantle). 2002;14(3):296-303.
18. Carlini EA, Galduróz JCF, Nappo SA. I Levantamento Domiciliar Sobre o Uso de Drogas Psicotrópicas no Brasil. CEBRID - UNIFESP, São Paulo, 2002.
19. McGeary KA, French MT. Illicit drug use and emergency room utilization. *Health Serv Res*. 2000;35(1 Pt 1):153-69.
20. Bast RP, Helmer SD, Henson SR, Rogers MA, Shafiro WM, Smith RS. Limited utility of routine drug screening in trauma patients. *South Med J*. 2000;93(4):397-9.
21. Gentilello LM, Ebel BE, Wickizer TM, Salkever DS, Rivara FP. Alcohol interventions for trauma patients treated in emergency departments and hospitals: a cost benefit analysis. *Ann Surg*. 2005;241(4):541-50.
22. Crawford MJ, Patton R, Touquet R, Drummond C, Byford S, Barrett B, Reece B, Brown A, Henry JA. Screening and referral for brief intervention of alcohol- misusing patients in an emergency department: a pragmatic randomised controlled trial. *Lancet*. 2004;364(9442):1334-9.