INTERNATIONAL JOURNAL OF RESEARCH – GRANTHAALAYAH
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PREVALENCE OF UNSOLVED DRINKING PROBLEMS FOR DUI DRIVERS REFERRED FOR MEDICAL EVALUATION IN SWITZERLAND

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ABSTRACT

Estimate the proportion of heavy DUI offenders who do not initiate a treatment for their drinking problem before referring to an official medical expertise to recover their driver's license. Evaluate the proportion of offenders with drinking problems who became abstinent during 6 months within two years after their offense and their characteristics. Between January 2010 and December 2012, data were collected from 1316 consecutive drivers who were referred to an expertise in a legal medicine Swiss institute to recover their driver's license after driving under the influence of alcohol. 153 offenders were included in the analysis after excluding patients under the influence of other recreational drugs and patients unfit to drive for other medical reasons. Heavy DUI were defined as first time drunk driving offenders with blood alcohol concentration (BAC) ≥2.50 g/kg, or second-time drunk driving offenders within five years with BAC ≥1.60 g/kg in five years, or third-time drunk driving offenders within ten years with BAC ≥0.80 g/kg. 28 subjects of 153 (18%) were considered fit to drive. The rest of the drivers (125, 82%) were considered unfit to drive (drinking problem 77, dissociation alone 48). The majority of offenders (46,4 %) had driving under the influence of alcohol 2 times in the last five years with BAC ≥ 1.60 g/Kg, 65 (42.5%) had BAC ≥ 2.5 and the rest had 3 or more drunk driving offenses. The criteria used for medical and/or psychological assessment are appropriate.

1. INTRODUCTION

The blood/alcohol limit in Switzerland is 50 milligrams of alcohol per 100 millilitres of blood (0.5 grams/litre). According to Swiss Council for Accident Prevention, in 2012, only 7 drivers out of

10 are capable of naming the currently applicable blood-alcohol limit (BPA, Rapport SINUS 2013). Therefore, it will not be surprising that driving under the influence of alcohol is common in our country. The Federal Statistics Office (FSO 2013) estimated than 8.8% of drivers tested for their alcohol level in 2012 had a blood alcohol concentration equalling or exceeding 0.5 ‰. During the same year, there were 14'763 convictions for drunk drivers with BAC qualified (> 0.8 ‰). There is also a slight increase in the number of punishment between 1990 and 2012; in 2012, 17'105 licences have been withdrawn for driving under the influence of alcohol.

Switzerland has set up a rigorous program to identify drunk drivers and then to refer them. Swiss Traffic Law specifies which drivers are to be referred by the Cantonal Driver and Vehicle Licensing Agency to a specialized institute for expert review (medical and/or psychological assessment to determine the presence (or not) of an alcohol problem). The authorities require an expert review whenever impaired fitness to drive is suspected; for example, when there is evidence of addiction (from a police or medical report). A review may also be requested even if no traffic offense has been committed. In most cases, however, one or more traffic offenses indicate an impaired fitness to drive. The expert review determines the nature and severity of the impairment and a written report is submitted to the authorities (Muschovich & Haag-Dawoud 2012).

In the Canton of Vaud (French speaking Switzerland, 800,000 inhabitants), the UMPT (Unit of Psychology and Traffic Medicine) in Lausanne has monitored fitness to drive for many years. When inability to drive is presumed for medical, psychological or psychiatric reasons, the unit is asked to prepare an expert evaluation for the Department of Motor Vehicles and Navigation (SAN). After this assessment, the expert determines whether the driver is considered unfit to drive, fit to drive, or fit to drive only under conditions. In the last case, appropriate restrictions are recommended; for example, abstention from alcohol and/or drugs. Conditions related to treatment may also be imposed. In case of unfitness, the driver is required to undergo a specialized follow-up in order to recover his/her license to drive.

The aim of this study is to estimate the proportion of heavy DUI offenders who do not initiate a treatment for their drinking problem before referring to an official medical expertise to recover their driver's license. Evaluate the proportion of offenders with drinking problems who became abstinent during 6 months within two years after their offense and their characteristics according to the current medical-psychological assessment (Roche et al. 1991; Bradley et al. 1995; Rollnick, Butter & Hodgson 1997;; Andréasson, Hjalmarsson & Rehnmen 2000; Wilson et al. 2011).

2. METHODS

DESIGN
This cohort study followed severe DUI for two years to compare abstinence success and recovery of driver's license for different types of DUI offenses following a standardized procedure of expertise.

POPULATION
Data was collected for a consecutive sample of severe DUI without any other possible cause of unfitness to drive (e.g. know consumption of other recreational drugs, other medical condition)

attending two experts in our Unit between January 2010 and December 2012. The flowchart (Fig.1) shows the process used for selecting the data to collect.

SEVERE DUI STATUS
Prior to the expertise, the Cantonal Driver and Vehicle Licensing Agency provided for each participant the following information: date of the offense, date of judgment, BAC, prior offenses related to alcohol and related BAC, and police report. Severe DUI were classified in three groups depending of their type of offense: 1) first time drunk driving offenders with blood alcohol concentration (BAC) $\geq$2.50 g/kg (BAC$\geq$2.5), 2) second-time drunk driving offenders within five years with BAC $\geq$1.60 g/kg in five years (2xBAC$\geq$1.6), and 3) third-time drunk driving offenders within ten years with BAC $\geq$0.80 g/kg (3xBAC$\geq$0.8).

DEFINING ABSTINENCE
Cases were defined as DUI with drinking problems who attended a medico-social curing program and were abstinent of alcohol consumption during the six prior months within the two years following their first expertise. Abstinence was assessed during a second expertise and documented by either a monthly blood sample revealing normal CDT, GGT, ASAT and ALAT concentrations, or by analyzing hair sample from the six previous months for ethyl glucuronide (EtG) (Muschovich & Haag-Dawoud 2012).

PROCEDURE
Severe DUI were informed by letter that an expertise was requested to attest the absence of drinking problems to recover their driver's license. On their initiative, they then contacted our unit for an expertise. The convocation letter provided details on the procedure and requested them to moderate their consumption of alcohol during the three weeks that preceded the expertise.
The expertise itself was standardized. Particular care was taken in assuring that both experts introduced the aim and reason for the expertise in a similar manner. Prior to questioning them on their drinking behavior, participants were informed that a blood sample would be collected revealing their alcohol consumption during the three previous weeks. They were also told that the expertise aimed to detect an eventual drinking problem and help them find medical solutions to their problem if it was to be the case. They were informed that it was in their interest to be as sincere and honest as possible in the answers they were to provide as there are to be confronted to possible contradictions with other exams. Each case was supervised by the same manager.

LABORATORY EXAMS
During the expertise, consumption of alcohol of the subjects is clinically and biologically controlled through a blood sample to revealing CDT, GGT, ASAT and ALAT concentrations.

STATISTICAL METHODS
The statistical analysis was performed using STATA 12.0. P-values are provided using Fischer's exact test. Significance level was set at P$\leq$ 0.05.

3. RESULTS

CHARACTERISTICS OF THE DRIVERS

The main characteristics of the drivers are presented in Table 1. As observed in other studies (Mura et al. 2003), males (136 of 153, 88.9%) heavily predominated over females (17 of 153, 11.1%). The age group of the drivers was: ≤ 25 years = 5 (3.3%), 25-44 years= 77 (50.3 %), 45-64 years= 65 (42.5%), ≥ 65 years = 6 (3.9%).

TYPES OF DRINKING PROBLEMS

The conclusion of the expert evaluation was classified in fit or unfits to drive and the specific reason for unfitness is given. The type of drinking problems at time of expertise are presented in Table I. 28 subjects of 153 (18%) were considered fit to drive. The rest of the drivers (125, 82%) were considered unfit to drive (drinking problem 77, dissociation alone 48). The results of BAC from all drivers investigated are shown in table I. The majority (46,4 %) had driving under the influence of alcohol 2 times in the last five years with BAC ≥ 1.60 g/Kg, 65 (42.5%) had BAC ≥ 2.5 and the rest had 3 or more drunk driving offenses.

PREVALENCE OF OFFENDERS HAVING ADDRESSED DRINKING PROBLEM BEFORE MEDICAL EXPERTISE

None of the 153 offenders had undergone any form of medical investigation for their drinking problem prior to their medical expertise. When only considering those with alcohol related problems (N=125), the observed prevalence of those having had addressed their problem with alcohol was of 0% (CI95% 0 to 2.9%).

PREVALENCE OF ABSTINENCE FOLLOWING MEDICAL EXPERTISE

Details of offenders who were abstinent within the two years following their offense is provided in Table 2. The overall period prevalence of success over two years after the offense is of 49.6% (CI95% 40.5 to 58.7). This prevalence appeared to be independent of the type of problem, drinking problem or dissociation alone, or the type of offense.

4. DISCUSSION

OVERVIEW OF OUR RESULTS

Our cohort study reveals that most people failed to resolve their problem before coming to expertise in our Institute. The overall period prevalence of success over two years after the offense is of 49.6% (CI95% 40.5 to 58.7). This prevalence appeared to be independent of the type of problem, drinking problem or dissociation alone, or the type of offense. According to our data, 25-44 years male subjects who are admitted to our center after à DUI are the primary target for any therapeutic intervention. The current measures are particularly suitable for drivers aged between 25 and 65 years. In agreement with O'Donnell and all. (2014), most of the results concerns the middle-aged men.

CONTRAST WITH OTHER FINDINGS

Del Rio and colleagues (2001) note that there are no valid tests or standardized criteria for identifying competency of drivers affected by alcohol dependency: 7 out of 10 drivers (70%) in

Spain who were diagnosed with alcohol-related problems were deemed fit to drive by the licensing authority's Medical Driving Test Centers.

According to the research results of the report of 2009 of the Monash University Accident Research Centre (*Charlton et al. 2010*), the problem is how to identify the at-risk driver with a chronic alcohol problem. More informative assessments may also be important for targeting interventions that are specific to the needs of drink-driving offenders. Numerous studies (Reid et al. 1986, Buchsbaum 1994, Piccinelli et al. 1997, Conigliaro et all. 1998, Jeanrenaud et al. 2003, Kuending 2010), have demonstrated that problem drinkers (hazardous drinking, alcohol abuse and alcohol dependence) can benefit from medical intervention, but lack of recognition of alcohol related problems by primary health care workers has been frequently reported and a long-term total alcohol abstinence should be recommended for the latter group due to the poor medical prognosis (Muschovich & Haag-Dawoud 2012). A study from Michigan suggests that more than 50% of first offenders reoffend within 10 years (Voas & Fisher, 2001). In Florida, however, where this study was conducted, the first-offender recidivism rate is as low as 17% over 10 years (personal communication from Milton Grosz, Florida Dept. of Highway Safety, 2006). National estimates show that, on average, one-third of the 1 million first-time DUI offenders arrested each year will reoffend (Voas & Fisher, 2001). An alternative strategy for reducing alcohol-impaired driving lies in the control of driving. Research shows that attempts to limit drinking and driving are undermined by several influences that prevail at drinking events (McKnight et al, 1995). These findings strongly suggest that the best way to prevent driving after drinking is not to have access to an automobile, a condition ensured only by not driving to locations where alcohol will be available (Rider e al. 2007).

LIMITATIONS OF THIS STUDY
The only alcohol problem is rare and involved only 153 of 1316 (11.6 %) drivers who were referred to an expertise in our Institute to recover their driver's license (Fig.1). Also, the drink-driving offenders are reticent to report their alcohol problem to authorities and to their medical practitioners. In addition to this, the medical practitioners don't intervene in decisions about licensing.

PRACTICAL APPLICATIONS
We should perhaps think about putting into practice of precise measurements for <25 years and >65 years. These findings provide additional arguments for improve alcohol assessment and treatment in this population. Lenaerts et all. note in their systematic review (Lenaerts et all 2014), that there is weak evidence continuing care have a beneficial effect knew alcohol consumption, but it also highlights the lack of evidence for possible best practices. O'Donnell et all, (2014) reviewed the efficiency of brief interventions in primary care medicine to reduce alcohol consumption to risk and problems related to the consumption of alcool. Duration, frequency and content optimal brief intervention remain unclear. There are still unanswered questions regarding the components required for an intervention to be effective.

5. CONCLUSION

We hope that our study will contribute to developing the public understanding of the alcohol and driving problem in Switzerland, and could encourage policymakers and politicians to increase

enforcement strategies and improve public awareness of different types of DUI offenses and the relevance of our procedure of expertise.

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TABLES

Table 1: Description of DUI severe offenders at time of expertise to attest absence of drinking problems

	Fit to drive N=28	Drinking problem N=77	Dissociation alone N=48	P-value	All severe DUI N=153
		Conclusion after expertise			
Gender; males	25 (89.3%)	65 (84.4%)	46 (95.8%)	P=0.128	136 (88.9%)
Age				P=0.244	
<25 yrs	3 (10.7%)	1 (1.3%)	1 (2.1%)		5 (3.3%)
25-44 yrs	15 (53.6%)	36 (46.7%)	26 (54.2%)		77 (50.3%)
45-64 yrs	10 (35.7%)	35 (45.5%)	20 (41.7%)		65 (42.5%)
≥ 65 yrs	0 (0%)	5 (6.5%)	1 (2.1%)		6 (3.9%)
Time between offense and expertise				P=0.594	
≤ 3 months	2 (7.1%)	2 (2.6%)	1 (2.1%)		5 (3.3%)
3-6 months	12 (42.9%)	43 (55.8%)	23 (47.9%)		78 (51.0%)
6-12 months	8 (28.6%)	18 (23.4%)	17 (35.4%)		43 (38.1%)
> 1 year	6 (21.4%)	14 (18.2%)	7 (14.6%)		27 (17.6%)
Reported history of drinking problems	2 (7.1%)	25 (32.5%)	15 (31.2%)	P=0.020	42 (27.4%)
Type of offense*					
BAC>2.5 g/kg	14 (50.0%)	44 (57.1%)	7 (14.6%)	P<0.001	65 (42.5%)
BAC 2x > 1.6 g/kg	14 (50.0%)	33 (42.9%)	24 (50.0%)	P=0.680	71 (46.4%)
BAC 3x > 0.8 g/kg	2 (7.1%)	9 (11.7%)	20 (41.7%)	P<0.001	31 (20.3%)

* Cumulative prevalence of type of offense adds up to more than 100% as cases can be categorized in more than one type of offense following their last interpelation.

Table 2: Prevalence of attested changes of behavior observed during the 2 years following the offense

	Drinking problem	Dissociation alone	P-value	All offenders with problems
	Comparing types of alcohol related problems			
Type of offense				
BAC>2.5 g/kg	21/44 (47.7%)	2/7 (28.6%)	P=0.436	23/51 (45.1%)
BAC 2x > 1.6 g/kg	18/33 (54.5%)	12/24 (50.0%)	P=0.472	30/57 (52.6%)
BAC 3x > 0.8 g/kg	3/9 (33.3%)	12/20 (60.0%)	P=0.177	15/29 (51.7%)
All offenders with problems	38 (49.3%)	24 (50.0%)	P=0.545	62/125(49.6%)

Figure 1:
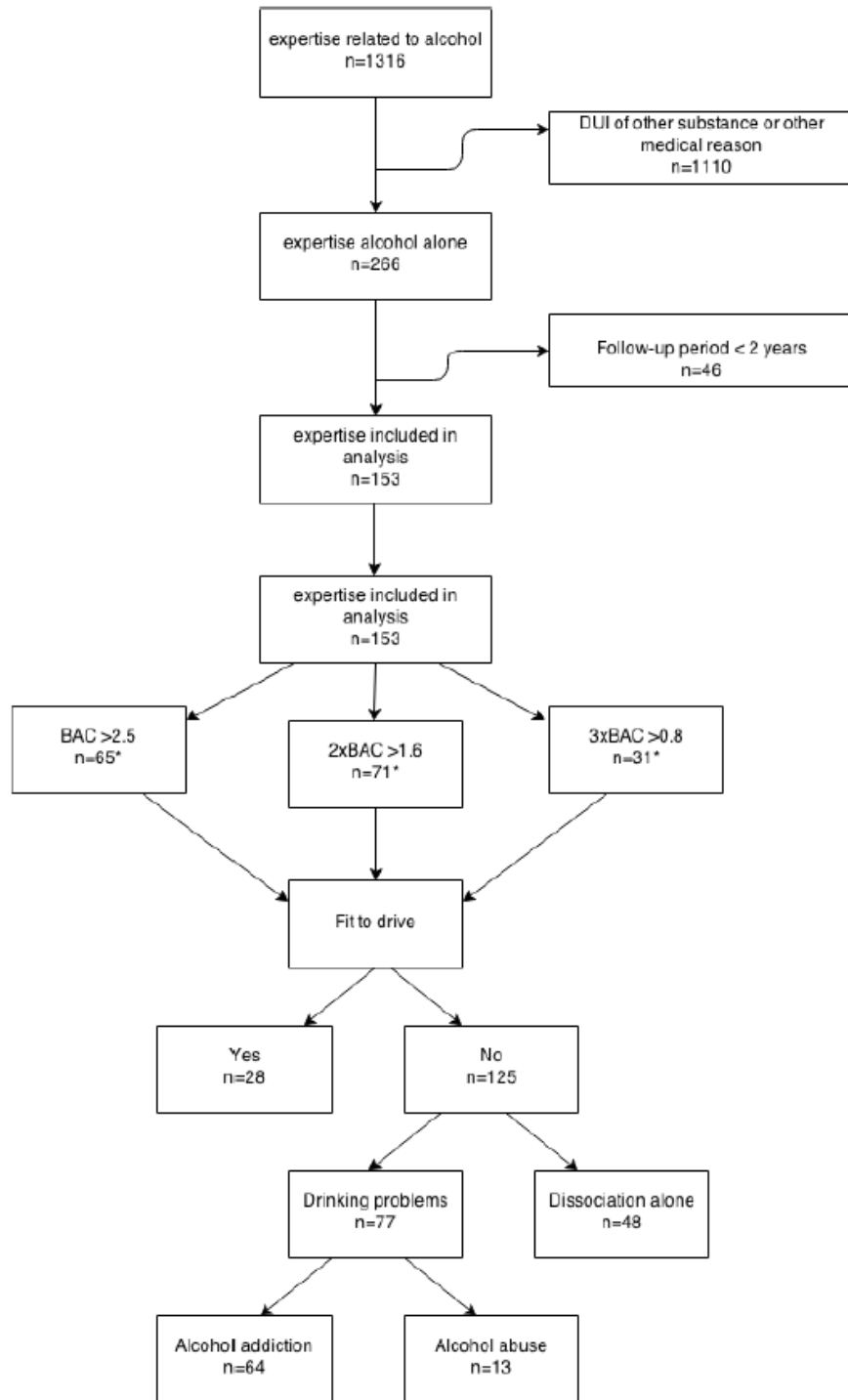
*= some adds up to more then the total number of offenders as participants can be in more than one category after their last offense