

ORIGINAL ARTICLE

Medicine Science 2022;11(4):1686-9

Evaluation of blood ethyl alcohol levels in the emergency service: the case of Şırnak province

ID Veysel Tahiroglu¹, ID Suna Ibrahimoglu²¹Şırnak University, Faculty of Health Sciences, Department of Nursing, Şırnak, Türkiye²Şırnak State Hospital, Department of Medical Emergency, Şırnak, TürkiyeReceived 10 October 2022; Accepted 18 October 2022
Available online 29.11.2022 with doi: 10.5455/medscience.2022.10.220Copyright@Author(s) - Available online at www.medicinescience.org

Content of this journal is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International.



Abstract

It is known that drinking and driving is an important factor causing traffic accidents and this situation affects every part of the society. The data for which ethyl alcohol was requested from the şırnak state hospital automation system between 01/01/2020 and 01/07/2022 will be analyzed statistically. Demographic characteristics and ethyl alcohol results of patients admitted to the emergency department were obtained from the hospital information management system. 90.8% of the 306 requests are male and 9.2% are female. 50.7% of the requests are from young people between the ages of 18–29 and 5.9% are under the age of 18. When the cases were evaluated according to age, traffic accidents took first place among individuals between the ages of 18-29. In the evaluation of the cases according to gender, traffic accidents were found to be higher in males, and we found it statistically significant ($p=0.016$). When the cases were evaluated according to their ethyl alcohol levels, it was seen that 284 out of 306 people were below 50 ml/dL. It was determined that 191 people applied as a result of a traffic accident, but they were not alcoholics, and it was found to be statistically significant ($P<0.001$). It is important that the study has the first remarkable findings for the province of Şırnak. We tried to make predictions by looking at the data we obtained from this study. In this study, the majority of which are traffic accident claims, young adults and men are in the majority. However, it is noteworthy that traffic accidents do not occur due to alcohol, but traffic rules are not followed.

Keywords: Ethyl alcohol, emergency, blood sample, traffic accident, forensic case

Introduction

They consist of carbon, hydrogen, and oxygen and are defined as organic compounds to which the –OH group is attached directly to the carbon group. Organic compounds such as ethanol and methanol are undesirable compounds that cause toxicity such as solvents, thinners, solvents, heavy metals, and toxic chemicals, which are classified in different ways in chemistry and cause adverse effects on human health, such as complex chemicals containing genotoxic substances such as benzene, toluene, and xylene. In addition to the frequency and magnitude of ethyl alcohol (ethanol)-related problems in clinical and toxicological terms, alcohol and alcohol products come to the fore more because they can cause unconsciousness, blindness, and traffic accidents due to alcohol consumption [1,2]. Alcohol addiction

is an important problem that continues to threaten human and public health despite all the precautions taken in recent years. Detection of alcohol use and alcohol dependence in the face of the law is of great importance. Since it is known that alcohol use increases aggression, criminal responsibilities related to alcohol addiction are determined by laws in our country [3]. Alcohol use among young people is associated with negative consequences in the form of reduced school success or work performance, deterioration in social order, violence, lawlessness, and deaths. One of the ways to prevent alcohol-related problems is through institutional regulations and government-issued laws. With these legal regulations, alcohol consumption decreases, and it is known that the risk of excessive drinking decreases [4]. Women have a smaller body size and body fat percentage than men. For women, a certain amount of alcohol is distributed over a smaller body volume since ethyl alcohol is not removed from fatty tissues. In addition, the ability to break down ethyl alcohol is limited by the size of the liver, and on average, women have smaller livers than men. All of these factors lead to higher Blood Alcohol Concentrations (BAC) in women than in men. In general, younger people are more tolerant of ethyl alcohol but have less experience with drinking

*Corresponding Author: Veysel Tahiroglu, Şırnak University, Faculty of Health Sciences, Department of Nursing, Şırnak, Türkiye
E-mail: veysel0793@hotmail.com

and the effects that may result from it. In addition, puberty is often accompanied by risk-taking behaviors (such as an increased risk of drinking in conjunction with other dangerous physical activities or risky sexual behaviors). As people age, their alcohol tolerance decreases, the risk of falls, traffic accidents, and adverse effects from drug interactions increases [4]. Easy access to ethyl alcohol-containing beverages is a factor facilitating abuse. Abuse brings with it important social health problems due to some problems it causes in individuals and their environment. One of the most important social problems caused by alcohol is traffic accidents [5-7]. In addition to traffic accidents, serious forensic case complaints that occur after alcohol use are among the main health problems among the reasons for applying to the alcohol-related emergency service [8]. This study, it is aimed to statistically evaluate the problems related to forensic cases, general medical examinations and traffic accidents.

Materials and Methods

The aim of this study was to retrospectively analyze ethyl alcohol levels from hospital databases in patients who applied to Şırnak state hospital emergency department between 01/01/2020 and 01/07/2022 after the approval of the ethics committee dated 21.09.2022 and numbered 2022/107 from Şırnak University Ethics Committee. performed by scanning. Data such as demographic characteristics such as age and gender, the unit from which the request was made, the pre-diagnosis coded in accordance with the International Classification of Diseases 10 (ICD-10) codes, whether the preliminary diagnoses were forensic, the time of request and blood ethyl alcohol levels were recorded. Due to the overcrowding and heavy workload in the emergency services, the risk of incorrect or incomplete pre-diagnosis of the patients who were requested was not ignored, and the prediagnoses that were thought to be inappropriate were separated and controlled. The epicrisis of these patients was examined one by one, and the preliminary diagnoses that were deemed inappropriate were corrected in accordance with the epicrisis. Samples are studied in the Medical Biochemistry Laboratory with the Abbott Architect c4000 analyzer (Abbott, Abbott Park, IL, USA) serum alcohol dehydrogenase enzymatic method, and the results are given as mg/dL and promil. Each daily shift change employs two levels of internal quality control, and the outcomes are accepted following these assessments. In addition, external quality control is carried out twice a month. Since the legal limit for blood ethyl alcohol level determined during driving for individual drivers in Turkey is 50mg/dL (0.5 promil), patient results above this value were considered as alcoholic [8].

Statistical analysis

The Statistics 21.0 package program (SPSS, Version 21.0. Armonk, NY: IBM USA) was used for statistical analysis, and Fisher's exact test was applied. $P < 0.05$ was considered significant.

Results

In the study, in which a total of 306 people were evaluated, the mean age of all patients was 30.63 ± 11.09 , of which 18 (5.9%) were under the age of 18, 155 were between the ages of 18-29 (50.7%), 73 were 30-39. age group (23.9%), 38 of them were between 40-49 years old (12.3%), 16 of them were between 50-64 years old (5.2%) and 6 of them were over 65 years old (2%). As

shown in Table 1, in the evaluation of the cases according to age, traffic accidents, forensic cases and general medical examinations were found to be high, respectively, especially in individuals between the ages of 18-29 ($p=0.569$). As shown in Table 2, Of the results, 278 (90.8%) belong to men and 28 (92.2) to women. In this table, when the cases were evaluated according to gender, traffic accidents were found to be higher in males. It was determined that women, like men, were mostly applied with complaints of traffic accidents. statistically significant ($p=0.016$). As shown in Table 3, The analysis of ethyl alcohol levels by age revealed that 155 participants were between the ages of 18 and 29. Among these people, there are 146 people under 50 ml/dL. $p=0.826$). As shown in Table 4, in the evaluation of ethyl alcohol levels by gender, 259 of 278 men were found to be below 50 ml/dL. It was found that 28 women had 25 below 50 ml/dL ($p=0.318$). As shown in Table 5, when the cases were evaluated according to their ethyl alcohol levels, it was seen that 284 out of 306 subjects were below 50 ml/dL. It was determined that 191 people applied with traffic accident complaints, but they were not alcoholic. It was also found to be statistically significant ($p < 0.001$).

Table 1. Evaluation of the cases according to age

Facts	<18	18-29	30-39	40-49	50-64	>65	P
Forensic Case	6	30	11	10	2	1	$p=0.569$
General Medical Examination	4	22	13	8	2	1	
Traffic Accidents	8	103	49	20	12	4	
Total(n)	18	155	73	38	16	6	
Total(%)	5.9	50.7	23.9	12.3	5.2	2	

Table 2. Evaluation of the cases according to gender

Facts	Male	Female	P
Forensic Case	50	10	$p=0.016$
General Medical Examination	43	7	
Traffic Accidents	185	11	
Total(n)	278	28	
Total(%)	90.8	9.2	

Table 3. Evaluation of ethyl alcohol levels by age

Ethyl alcohol levels	<18	18-29	30-39	40-49	50-64	>65	P
<50 ml/dL	18	146	63	35	16	6	$p=0.826$
50-100 ml/dL	0	1	1	1	0	0	
100-200 ml/dL	0	4	4	1	0	0	
200-300 ml/dL	0	4	5	1	0	0	
300-400 ml/dL	0	0	0	0	0	0	
Total(n)	18	155	73	38	16	6	

Table 4. Evaluation of ethyl alcohol levels by gender

Ethyl alcohol levels	Male	Female	P
<50 ml/dL	259	25	$p=0.318$
50-100 ml/dL	2	1	
100-200 ml/dL	7	1	
200-300 ml/dL	9	1	
300-400 ml/dL	1	0	
Total(n)	278	28	

Table 5. Evaluation of the cases according to their ethyl alcohol levels

Facts	<50 ml/dL	50-100 ml/dL	100-200 ml/dL	200-300 ml/dL	300-400 ml/dL	P
Forensic Case	50	2	2	5	1	<0.001
General Medical Examination	43	1	4	2	0	
Traffic Accidents	191	0	2	3	0	
Total(n)	284	3	8	10	1	
Total (%)	92.8	1	2.6	3.3	0.3	

Discussion

Ethyl alcohol requests originating from the emergency department were evaluated from different aspects. Ethyl alcohol is a beverage with a high consumption rate, which has been proven to be directly related to violence and diseases all over the world. In line with the laws in our country, individuals who drink ethyl alcohol higher than 50mg/dl are prohibited from driving [2]. The frequency of traffic accidents has increased in individuals who drink ethyl alcohol, and there are many reasons for this. At the beginning of these reasons are the deterioration in attention, perception, memory, reasoning, reaction speed and behavioral conditions of individuals who take ethyl alcohol [10]. Yilmaz et al. In a study they conducted with ethyl alcohol levels, nearly 40% of the patients whose serum ethyl alcohol levels were analyzed were young patients between the ages of 18-29, while in our study, patients between the ages of 18-29 constituted 50.7% [11]. It has been reported that the higher demand for ethyl alcohol in young people, who are in the most active period of life, may be related to the high rate of alcohol use, spending more time in traffic, and driving more carelessly [12]. Considering the cases under the age of 18 according to age, they constituted 5.7% in our study, while Yilmaz et al. in their study, it was reported that they constituted 3.7% [11]. Sayal et al., while not specifying under 18 years of age, emphasize that individuals consuming alcohol in the 15-22 age group are 62.3% higher than other age groups, whereas in our study, no alcoholic individuals under the age of 18 were found [13]. While 90.8% of the ethyl alcohol requests belong to men, 9.2% belong to women patients. In the evaluation of the cases according to gender, we found that traffic accidents were higher in males, and other studies similar to ours support this picture [5,6,11,13]. Among the requests in the study, the second rank was forensic cases, while the third rank was general medical examination. 7.2% of all requests in the study were found to be alcoholic above the legal limit. We found that a very large group of 92.8% were non-alcoholic and statistically significant. There are different rates in different studies, and it is known that this situation may be of regional origin, the role of the health center where the analysis is made, the patient population it serves, and the region [5,13]. In our study, it is noteworthy that the accumulation in the concentration ranges of 100-200mg/dL and 200-300 mg/dL, respectively, is higher than the other ranges. This situation is more evident in alcoholic patients who are above the legal limit. In a similar study conducted in Eskişehir, it is observed that the results are especially in these ranges [14]. Limitations of the study: Since the time between alcohol consumption, hospitalization, and blood collection of the people involved in the accident in the sample group is not known, the ethanol amounts were determined according to the blood samples taken at the hospital. Since it was not recorded whether the vehicles involved

in the accident were commercial or not, all assessments were made on the basis of private vehicles.

Conclusion

There was no statistically significant difference between the amount of alcohol in the blood and the severity of injury in our study conducted in rnak province, and there was no result supporting the general view that drunk driving significantly increases the degree of injury. Due to the lack of information about first aid in traffic accidents, the wrong intervention after the accident or the failure to perform the necessary intervention can also increase the degree of injury of the injured person who has been exposed to trauma. In this century we live in, dizzying technological advances with the effect of globalization, industrial developments in the automotive sector, and rapid population growth have paved the way for an increase in the number of vehicles in all countries of the world and for cities that do not have sufficient infrastructure yet to face traffic accidents. In this study, it was seen that the number of people who applied to the emergency services due to traffic accidents was high. Although traffic accidents cannot be completely eliminated, all individuals who make up society should transform the traffic culture into an attitude in order to minimize traffic accidents.

Conflict of interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

All authors declare no financial support.

Ethical approval

Ethics approval numbered 2022 /107 was received from Şırnak University Ethics Committee on 21.09.2022.

References

1. Alayunt NO , Tasgin S. Examination of serum oxidant-antioxidant levels of workers at dyehouses of textile sector in Denizli's industrial estate. *Med Science*. 2019;8:836-40.
2. Baduroglu E, Durak D. Alcohol-related forensic problems. *Uludağ University Faculty of Medicine Journal*. 2010;36:65-71.
3. Demirel OF, Balcioglu I. Criminal liability and legal capacity of alcohol and substance dependence. *New Symposium*. 2015;53:27-33.
4. Roche AM, Bywood P, Freeman T, et al. The social context of alcohol Use in Australia. *National Centre for Education and Training on Addiction* 2009;1-147.
5. Goksu E, Çete Y, Kanalıcı H, Kılıçaslan I. The relationship between demographic, clinical characteristics and blood ethyl alcohol level of patients admitted due to traffic accident. *Turk J Emerg Med*. 2008;8:26-31.
6. Akay N, Kurtoglu CG, Karakayali O et al. Effects of blood alcohol levels on injury severity and cost in motor vehicle accidents. *Ankara Med J*. 2014;14:5-10.
7. Asardizer M, Yilmaz M, Aker RG et al. Evaluation of blood ethyl alcohol levels of drivers involved in traffic accidents. *Nobel Med*. 2016;12:5-13.
8. Cherpitel CJ. Alcohol and injuries: a review of international emergency room studies. *Addiction*. 1993;88:923-37.
9. HighwayTrafficLawNo.2918.LegislationInformationSystem,e-Legislation. Relation=0&sourceXmlSearch=Traffic&Tur=1&Order=5&No=2918. accessed on 08.10.2022.
10. Driver Behavior Development Training <https://istanbulism.saglik.gov.tr/Eklenti/21456/0/ Dersnotlaripdf> access date 08.10.2022.

11. Yılmaz İ, Şahin S, Bozkaya G. Demographic and clinical characteristics of blood ethyl alcohol level requests from the emergency department and its relationship with concentration: the example of İzmir. İzmir Training and Research Hospital Medical Journal. 2020;24:21-8.
12. Fujita Y, Shibata A. Relationship between traffic fatalities and drunk driving in Japan. Traffic Inj Prev. 2006;7:325-7.
13. Sayal A, Aydın A, Demirhan K, İşimer A. Alcohol use and crime rate. Gulhane Medical Journal. 2005;47:14-7.
14. Dogan S. The relationship between blood alcohol level and the severity of injury in patients admitted to the emergency department due to an in-vehicle traffic accident. Eskişehir Osmangazi University Faculty of Medicine, Department of Emergency Medicine, Specialization Thesis in Medicine 2015