

ASSOCIATION OF EARLY DRINKING ONSET WITH SUBSEQUENT ALCOHOL ABUSE

Agnieszka Bratek¹, Julia Beil², Karolina Jarzabek², Monika Banach²,
Krzysztof Krysta³ & Irena Krupka-Matuszczyk³

¹Central Clinical Hospital, Medical University of Silesia, Katowice, Poland

²Department of Psychiatry and Psychotherapy, Students' Scientific Society, Medical University of Silesia, Katowice, Poland

³Department of Psychiatry and Psychotherapy, Medical University of Silesia, Katowice, Poland

SUMMARY

Background: In the recent years the phenomenon of early alcohol initiation is observed. This problem is often underestimated, in spite of its numerous negative consequences

Subjects and methods: The research study was based on authors' anonymous questionnaire including questions referring to: age of alcohol initiation, age of the first blackout after drinking alcohol, the place and circumstances of alcohol initiation and the reason of drinking alcohol for the first time. The study group consisted of 125 people, 83 men and 42 women, aged from 22 to 68 participating in treatment programs for alcohol addiction.

Results: In the study group it occurred before the age of 15 more often than in the control group (49% vs. 42%). The same correlation exists for the alcohol initiation before 12 years of age (13% vs. 8%) and is statistically significant ($p < 0.05$). What's very alarming drinking alcohol for the first time took place for some of the respondents before the age of 10 and also significantly more often in the study group (6% vs. 2%, $p < 0.05$).

Conclusions: The obtained results allow to conclude that in patients addicted to alcohol the initiation took place earlier than in the study group (age 13-15 vs. 16-18). Also, very early alcohol initiation (<12 years) occurred more frequently in the study group (12.8% vs 8.2%). Based on our research, we confirmed that early drinking onset is associated with subsequent alcohol dependence.

Key words: alcohol addiction - early alcohol initiation - adolescence

* * * * *

INTRODUCTION

Alcoholism is a major problem of the modern world. Alcohol initiation occurs earlier and earlier, on average adolescents now take their first drink at the age of 12 years. This problem seems to be wrongfully underestimated, despite the fact that it holds numerous negative consequences: onset of drinking at an early age has been found to be associated not only with later alcohol dependence, but also with drug abuse, law violations, risky sexual behavior and aggressive behavior during adolescence (Robins & Przybeck 1985). It is estimated that for the population as a whole, 50% of violent crime is related to alcohol use (Harwood et al. 1998), however there is no data available only in adolescents, so we can presume it is similar. According to the National Highway Traffic Safety Administration (2002) annually almost 2,000 youths under age 21 in the USA die from alcohol-related traffic injuries that involve underage drinking. Early onset of alcohol or other drug use is also one of the strongest predictors of later alcohol dependence. There are findings indicating that early drinking onset implies an increased risk of dependence, regardless of family history, which is also a known risk factor (Grant 1998). It is estimated that most long-term drug or alcohol abuse starts during adolescence. According to epidemiologic analyses, people who started drinking at age 14 and earlier are approximately four times more likely to become alcohol dependent as adults than those

who started drinking in their twenties (Grant & Dawson 1998). If drinking is delayed until age 21, a child's risk of serious alcohol problems is decreased by 70 percent. According to Spear (2002) there can be two possible views, not necessarily mutually exclusive, on the significance of early alcohol initiation. First, exposure to alcohol or other drugs during adolescence may impair brain development that occurs at that time, increasing the likelihood of problems with alcohol later in life. Another interpretation is that early alcohol initiation is not a precursor but a marker for later abuse disorders. The report published by Substance Abuse and Mental Health Services Administration (2012) show that there is very specific and interesting data from the United States showing the scale of the problem - in 2011 approximately 9.7 million of people aged 12 - 20 (25.1% of this age group) reported drinking alcohol in the past month. Approximately 6.1 million (15.8%) were binge drinkers, and 1.7 million (4.4%) were heavy drinkers. It is worth mentioning that this particular period - age between period of age between 12 and 20 years old is crucial for the central nervous system development as this is a time of substantial neuromaturation that involves important changes in numerous brain regions, in particular subcortical gray matter and limbic system structures (septal area, hippocampus and amygdala) increase in volume. Such developmental changes can result in certain vulnerabilities for the adolescent brain (Dahl 2004). Studies on animal models revealed that

adolescent brains are more susceptible than adult brains to neurochemical changes, neurodegeneration, long-lasting changes in functional activity, and impairments in spatial memory acquisition (Zeigler 2005). Regions of the brain that are especially vulnerable to damage after years of chronic alcoholism include the cerebellum, the limbic system, the diencephalon, and the cerebral cortex (Oscar-Berman et al. 1997). Due to their function alcohol-related damage of aforementioned areas of the brain can result in a loss of attention, impaired decision making, poor concentration, memory impairment, increased impulsivity, anxiety and loss of behavioral control. In an interesting study, magnetic resonance imaging was used to measure the hippocampal volume in adolescents and young adults with adolescent onset alcohol use disorder (De Bellis et al. 2000). It was found that both left and right hippocampal volumes were significantly smaller (approximately 10%) in subjects with alcohol use disorders than in nonusers. Total hippocampal volume correlated positively with the age of onset and negatively with the duration of the alcohol use disorder. There is a conception that alcohol may have direct toxic effects on the hippocampus through NMDA receptors that are being up-regulated by chronic alcohol consumption (Breese et al. 1995). Unfortunately, this period of mental and emotional vulnerability which is adolescence is also associated with a natural tendency towards risk taking, sensation seeking, strong emotions, increased social behavior and tendency to experiment with drugs and alcohol (Dahl 2004). Increased social interactions and exploratory and risk-seeking behaviors is a characteristic of adolescence that occurs in many species, including rats and humans (Spear 2000).

SUBJECTS AND METHODS

The research study was prepared based on an author anonymous questionnaire including questions on: age of alcohol initiation, age of the first blackout after drinking alcohol, the place and circumstances of alcohol initiation and the reason of drinking alcohol for the first time. The questionnaire was handed out to the patients of the Alcohol Detoxification Unit at the Specialist Mental Health Hospital in Rybnik, Poland and members of 7 Alcoholics Anonymous support groups in 3 Silesian cities – Katowice, Rybnik and Zawiercie. Our control group consisted partly of students of Medical University of Silesia. In the study group there were 125 people, 83 men and 42 women, aged from 22 to 68 (mean 45). In the control group there were 231 people, 136 men and 95 women, age 17-65 (mean 24). All statistical analyses were performed with the use of Statistica 6.0 software. The results were considered as significant with a p value <0.05 . The chi-squared test was used for qualitative variables. In our survey, we asked about the age of alcohol initiation.

RESULTS

In the study group alcohol initiation occurred before the age of 15 more often than in the control group (49% vs. 42%). The same correlation exists for the alcohol initiation before 12 years of age (13% vs. 8%) and is statistically significant ($p<0.05$). What is very alarming drinking alcohol for the first time took place for some of the respondents before the age of 10 and also significantly more often in the study group (6% vs. 2%, $p<0.05$). The most common age of alcohol initiation was 13-15 for alcoholics (36% vs. 34% in the control group) and slightly later, between 16-18 (41%) in the group of non-alcoholics. Significantly more frequently alcoholics experienced their first blackout after drinking alcohol before the age of 15 (26% vs 8% in the control group; $p<0.01$). Before 12 years of age this occurred in 7% of study group and 1% of control group ($p<0.05$). Furthermore, in 5% of them it happened before the age of 10.

However, most often it took place after 15 in both groups (54% vs. 54%). As for the circumstances of alcohol initiation, one may have the impression that the environmental impact was greater for alcoholics compared to the control group - 11% (3% in the control group; $p<0.05$) drank alcohol for the first time at school, whereas the control group more often were introduced to alcohol at home, surrounded by family, however the difference between groups in this case was minor (24% vs. 22%). Almost equally often the two groups reached for alcohol for the first time: in the park/on the street (24% vs 21%) and at the club/at a party (14% vs 16%).

The questionnaire also contained a multiple choice question on the reasons for drinking alcohol for the first time. And interesting and statistically significant difference in responses between the two group was observed in the answer I was under the influence of strong emotions (14% vs. 0% in the control group; $p<0.01$). As mentioned before the environmental impact was greater for people addicted later, as indicated by responses (with a desire to impress peers - 29% vs. 12%; $p<0.05$) and under pressure from peers (15% vs. 11%). Other common responses were out of curiosity (41% vs. 55%) or for the company (45% vs. 62%).

The responses on the question "Have you ever experienced an alcohol-related conflict with the law?" were as follows (study group vs control group): once - 30% vs 14% $p<0.05$. several times - 13% vs 6%, $p<0.05$, tens of times - 3% vs 0%. dozens of times - 6% vs 2%, $p<0.05$. There is evidence that people drinking as adolescents may have future problems with changing conditions and predicting the consequences of their actions, which is probably related to biochemical and structural changes in the frontal cortex. Animal studies revealed that binge-induced brain damage in the frontal region is associated with binge drinking in adolescents (Crews et al. 2000). This could also explain that aggressive behavior after drinking alcohol is significantly more common in the study group. On a question "Did you ever acted aggressively after drinking alcohol?" the

answer never was chosen by 72% of the control group while only by 21% of the study group ($p < 0.01$). The study group more often replied "sometimes" (34% vs 9%; $p < 0.01$).

DISCUSSION

The results we have obtained allow us to conclude that in patients with alcohol dependence alcohol initiation took place earlier than in the study group (age 13-15 vs. 16-18). Also, very early alcohol initiation (<12 years) occurred more frequently in the study group (12.8% vs 8.2%). Based on our research, we confirmed that early drinking onset is associated with subsequent alcohol dependence. Our observation is similar to other findings in the literature (Gruber et al. 1996, Henry et al. 2011). Alcohol – abusing persons consciously drank alcohol earlier and earlier experienced a blackout, and on average they reached for alcohol for the first time under the influence of strong emotions and influenced by their friends at school, they were significantly more aggressive and had more alcohol - related conflicts with the law. Although drinking alcohol under certain age is illegal in the vast majority of countries it is time to abandon illusions because underage youth find it relatively easy to obtain alcohol and often the source of alcohol is their own parent. The above results raise the problem of the necessity for prevention programs in schools and other facilities for young people (Borucka et al. 2008, Conrod 2013).

CONCLUSIONS

There should be greater social awareness of the negative consequences of drinking on adolescents because the problem of underage drinking is very important not only for the alcohol-abusing teenager and his family but for the society as a whole.

Acknowledgements: None.

Conflict of interest: None to declare.

References

1. Borucka J, Krysta K, Wolna A, Cichon M, Janas-Kozik M, Przybylo J et al.: *Addiction problems among high school students in two Polish cities. Eur Psychiatry* 2008; 23 Suppl 2:S311.
2. Breese CR, Freedman R & Leonard SS: *Glutamate receptor sub-type expression in human postmortem brain tissue from schizophrenics and alcohol abusers. Brain Res* 1995; 674:82–90.
3. Conrod PJ, O'Leary-Barrett M, Newton N, Topper L, Castellanos-Ryan N, Mackie C et al.: *Effectiveness of a selective, personality-targeted prevention program for adolescent alcohol use and misuse: a cluster randomized controlled trial. JAMA Psychiatry* 2013; 70:334-42.
4. Crews FT, Braun CJ, Hoplight B, Switzer RC 3rd & Knapp DJ: *Binge ethanol consumption causes differential brain damage in young adolescent rats compared with adult rats. Alcohol Clin Exp Res* 2000; 24:1712–23.
5. Dahl RE: *Adolescent brain development: a period of vulnerabilities and opportunities. Keynote address. Ann N Y Acad Sci* 2004; 1021:1-22.
6. De Bellis MD, Clark DB, Beers SR, Soloff PH, Boring AM, Hall J et al.: *Hippocampal volume in adolescent-onset alcohol use disorders. Am J Psychiatry* 2000; 157:737-44.
7. Grant BF: *The impact of a family history of alcoholism on the relationship between age at onset of alcohol use and DSM-IV alcohol dependence: Results of the National Longitudinal Alcohol Epidemiologic Survey. Alcohol Health Res World* 1998; 22:144-7.
8. Grant BF & Dawson DA: *Age at onset of alcohol use and its association with DSM-IV alcohol abuse and dependence: results of the National Longitudinal Alcohol Epidemiologic Survey. J Subst Abuse* 1998; 10:163-73.
9. Gruber E, DiClemente RJ, Anderson MM & Lodico M: *Early drinking onset and its association with alcohol use and problem behavior in late adolescence. Prev Med* 1996; 25:293-300.
10. Harwood HJ, Fountain D & Livermore G: *Economic costs of alcohol abuse and alcoholism. Recent Dev Alcohol* 1998;14:307-30.
11. Henry KL, McDonald JN, Oetting ER, Walker PS, Walker RD & Beauvais F: *Age of onset of first alcohol intoxication and subsequent alcohol use among urban American Indian adolescents. Psychol Addict Behav* 2011; 25:48-56.
12. National Highway Traffic Safety Administration (NHTSA). *Traffic Safety Facts: Alcohol. DOT Pub. No. HS-809-606. NHTSA, Washington DC, 2002.*
13. Oscar-Berman M, Shagrin B, Evert DL & Epstein C: *Impairments of brain and behavior: the neurological effects of alcohol. Alcohol Health Res World* 1997; 21:65-75.
14. Robins LN & Przybeck TR: *Age of onset of drug use as a factor in drug and other disorders. NIDA Res Monogr* 1985; 56:178-92.
15. Spear LP: *Modeling adolescent development and alcohol use in animals. Alcohol Res Health* 2000; 24:115-23.
16. Spear LP. *Alcohol's Effects on Adolescents. Alcohol Res Health*. 2002; 26:287-91.
17. *Results from the 2011 National Survey on Drug Use and Health: Mental Health Findings, NSDUH Series H-45, HHS Publication No. (SMA) 12-4725. Substance Abuse and Mental Health Services Administration, Rockville, MD, 2012.*
18. Zeigler DW, Wang CC, Yoast RA, Dickinson BD, McCaffree MA, Robinowitz CB et al.: *Council on Scientific Affairs, American Medical Association: The neurocognitive effects of alcohol on adolescents and college students. Prev Med*. 2005; 40:23-32.

Correspondence:

Agnieszka Bratek
Central Clinical Hospital of The Medical University of Silesia
Medyków 14, Katowice, Poland
E-mail: agnieszka-bratek@o2.pl