

The “Eyeballing” technique: an emerging and alerting trend of alcohol misuse

F.S. BERSANI^{1,2}, O. CORAZZA², G. ALBANO³, S. BRUSCHI⁴, A. MINICHINO², R. VICINANZA⁵, G. BERSANI³, G. MARTINOTTI⁶, F. SCHIFANO²

¹Department of Neurology and Psychiatry, Sapienza University of Rome, Rome, Italy

²School of Life and Medical Sciences, University of Hertfordshire, UK

³Department of Medical-Surgical Sciences and Biotechnologies, Sapienza University of Rome, Rome, Italy

⁴Department of Ophthalmology, Ocular Immunovirology Service, Sapienza University of Rome, Rome, Italy

⁵Department of Cardiovascular, Respiratory, Nephrologic and Geriatric Sciences, Sapienza University of Rome, Rome, Italy

⁶Department of Neuroscience and Imaging, Gabriele D’Annunzio University, Chieti, Italy

Abstract. – OBJECTIVE: Alternative methods of alcohol consumption have recently emerged among adolescents and young adults, including the alcohol “eyeballing”, which consist in the direct pouring of alcoholic substances on the ocular surface epithelium. In a context of drug and behavioural addictions change, “eyeballing” can be seen as one of the latest and potentially highly risky new trends. We aimed to analyze the existing medical literature as well as online material on this emerging trend of alcohol misuse.

MATERIALS AND METHODS: Literature on alcohol eyeballing was searched in PsychInfo and Pubmed databases. Results were integrated with a multilingual qualitative assessment of the database provided by The Global Public Health Intelligence Network (GPHIN) and of a range of websites, drug fora and other online resources between March 2013 and July 2013.

RESULTS: Alcohol eyeballing is common among adolescents and young adults; substances with high alcohol content, typically vodka, are used for this practice across the EU and internationally. The need for a rapid/intense effect of alcohol, competitiveness, novelty seeking and avoidance of “alcoholic feter” are the most frequently reported motivations of “eyeballers”. Local effects of alcohol eyeballing include pain, burning, blurred vision, conjunctive injection, corneal ulcers or scarring, permanent vision damage and eventually blindness.

CONCLUSIONS: Alcohol eyeballing represents a phenomenon with potential permanent adverse consequences, deserving the attention of families and healthcare providers. Health and other professionals should be informed about this alerting trend of misuse. Larger observational studies are warranted to estimate the

prevalence, characterize the effects, and identify adequate forms of interventions for this emerging phenomenon.

Key Words:

Alcohol eyeballing, Alcohol misuse, Substances abuse, Addiction, Binge drinking, New trends.

Introduction

Alcohol-use disorders are among the most relevant medical and public health problems, resulting in significant morbidity, mortality, and high health care expenses and leading to adverse social, psychological, occupational, legal, and medical consequences¹⁻³. According to the World Health Organization “Status Report on Alcohol and Health in 35 European Countries 2013”, alcohol consumption has been identified as a major risk factor for the burden of disease and for premature mortality globally, and as a substantial problem in the European Region¹. In the European Union, 1 in every 7 deaths in men and 1 in every 13 deaths in women in the group aged 15-64 years is due to alcohol consumption, and alcohol is considered to be causally relevant for more than 200 International Classification of Diseases (ICD)-10 three digit codes¹.

In the past few years alternative methods of alcohol consumption emerged among adolescents and young adults, including the alcohol “eyeballing”, which consists in the direct pouring of alcoholic substances on the ocular surface epithelium⁴.

This phenomenon, together with some other behaviours like “choking”⁵, is typically associated with binge drinking and multiple substance abuse. About 90% of the alcohol consumed by youth under the age of 21 in the United States is in the form of binge drinks and the teen binge-drinking rate in Europe ranges between 28% and 60%⁶. It is known that binge-type drinking is a crucial step in adolescents’ progression to alcohol abuse and dependence⁷ and that binge drinking is usually associated with unintentional injuries (e.g., car crashes, falls, burns, drowning), intentional injuries (e.g., firearm injuries, sexual assault, domestic violence), and many health problems including alcohol poisoning, sleep disorders, altered neurodevelopment, anxiety and cognitive impairments⁸⁻¹¹.

Alcohol eyeballing can be seen as a new trend of misuse within the phenomenon of the rapid diffusion of new forms of addiction and drug abuse. This phenomenon represents not only an unprecedented challenge in the field of drug addiction but also a fast growing challenge from social, cultural, legal and political perspectives¹²⁻¹⁴.

Alcohol eyeballing has potential permanent adverse consequences and seems to be prevalent in the United States (US) and the United Kingdom (UK). However, recent alerts have also been recorded in several EU Member States, Asia and Oceania. Considering the above, we aimed here at firstly analysing the existing medical literature as well as online material on this new way of alcohol misuse.

Materials and Methods

The literature on alcohol eyeballing was searched in PsychInfo, Pubmed, EBSCO and Scopus databases. Considering the very limited peer-reviewed data, results were integrated with a multilingual qualitative assessment of a range of websites, drug fora and other online resources (i.e.: newsgroups, chatrooms, mailing lists, e-newsletters, and bulletin boards). Between March 2013 and July 2013, exploratory qualitative searches of websites have been carried out in English using generic and specific keywords, such as “alcohol eyeballing”, “vodka eyeballing”, “alcohol abuse”, “substances abuse”, and “college alcohol abuse” in the Google search engine. These websites were monitored on a regular basis, daily, weekly or monthly depending on relevance. Links from forums, websites and other related material, includ-

ing newspapers and magazines, were followed as well. Additional searches were carried out in the database provided by The Global Public Health Intelligence Network (GPHIN). This is a secure Internet-based early warning system that gathers preliminary reports of public health significance by monitoring global media sources near ‘real-time’, 24 hours a day, 7 days a week basis. GPHIN is operated by the Public Health Agency of Canada, and monitors news sources and websites across the globe in 9 languages (e.g. English, French, Farsi, Portuguese, Arabic, Russian, Spanish, and Chinese simplified/traditional)¹⁵. Permission for the study was granted by the School of Pharmacy Ethics Committee, Hatfield, UK (15 December, 2010; PHAEC/10-42).

Results

Only two brief communications regarding alcohol eyeballing were identified on PubMed and PsycInfo^{4,16} both published in 2013 in Spanish language. A statement from the American Academy of Ophthalmology about “Vodka Eyeballing” was released in 2010¹⁷. Several YouTube videos and articles in online newspapers were identified through the other utilized search engines¹⁸⁻²⁴. Several online reports of personal experiences were identified as well²⁵⁻³⁰; examples are provided in Table I.

Ways of Consumption

The eyeballing technique is performed by pouring alcoholic substances directly into the eyes^{4,16}. Substances with high alcoholic content are generally preferred, although cases of misuse of other substances (e.g., cinnamon schnapps [15-50% alcohol by volume [ABV]]) have also been reported^{19,21,22,29,30}.

According to anecdotal online and media reports, substances with high alcoholic content are generally preferred because young consumers believe that the desired effects (“highs”) can be achieved in shorter time; although the trend may vary according to individual preferences, vodka (35-50% ABV) is currently the most commonly used alcoholic drink. Alcohol eyeballing is usually performed in combination with alcohol oral ingestion^{4,16,19,25,29,30}.

Diffusion

Eyeballing seems to be a diffuse trend of abuse among college and university students in

Table I. Relevant personal experiences related to vodka eyeballing.

<p style="text-align: center;">Desired effects of vodka eyeballing</p> <p>"I just took some vodka in my eyeball and i feel funny. I did not have my eye open when i did it i just sort of blinked it in, and my eye feels funny like painfull. I have been drinking all day as well and that shot did more to me than any other i have had tonight"²⁶.</p> <p>"It makes more sense than filling your stomach up with vodka, and getting drunk and sober at a less controllable rate"²⁹.</p> <p>"It induces feelings of drunkenness at break-neck speeds, providing an instant high"³⁰.</p> <p style="text-align: center;">Unpleasant immediate effects of vodka eyeballing</p> <p>"The other night me and a few friends decided to engage in the wonderful method of "eyeballing" shots of vodka. It hurt like nothing else and reaction to said method was to roll around on floor holding eye swearing and shouting. Apparently it gets you drunk faster, but none of us were brave enough to take a whole shot, so this is still to be confirmed"²⁵.</p> <p>"Me and my girlfriend were at a party and one of her friends who was really drunk poured a shot of vodka in her eye. She says she is in a lot of pain and cannot see out of it"²⁷.</p> <p>"I did that once before! The high volume of alcohol going into your eye will make your eye very bloodshot, sting and it give you a headache, or dizzy! The alcohol will affect you pretty much straight away!"²⁶.</p> <p>"I've tried it, only once ,is very harmful for the eyes, it goes to your bloodstream faster for THE AMOUNT you use, however you can drink more much faster so really, you can get drunker faster by drinking it normally"²⁸.</p> <p style="text-align: center;">Unpleasant delayed/permanent effects of vodka eyeballing</p> <p>"My vision is okay but my eye is irritated and burning"²⁶.</p> <p>"I'm in constant pain because of what I did, my constantly watering left eye has been left permanently scarred by my antics. It got more and more sore and bloodshot. It was as if I had conjunctivitis all the time. It was sore and weepy, very sensitive. I was really frightened"³⁰.</p> <p>"At the moment, my vision is blurred in that eye, but that's because it's watering all the time. It's really sore and weepy. I've got used to the pain now. I just have to bear it. I don't think people can tell looking at me, but it is more bloodshot than the other one. It's never a clear white colour. It's hard to wear eye make-up because if anything goes in it, it's really painful and starts watering"³⁰.</p> <p style="text-align: center;">Use of other types of alcohol</p> <p>"One of my friends did it at a party, repeatedly throughout the night about 4 years ago. He was using some sort of tequila, think it was called Samba. [...] He never had any long lasting ill effects from it though, just at the time of doing it"³⁰.</p> <p>"I've tried snorting and eyeballing a shot of single malt. That was pretty horrendous"³⁰.</p>

the UK and the US, although recent alerts have also emerged in Spain, Italy, France, Eastern European Countries, Canada, Japan and Australia^{16,18,20,23,31}. Its popularity is witnessed by about 22,600 results on the Google Search engine for the term "vodka eyeballing"³² and by about 1,500 clips on YouTube website²⁴. A Google Trend search on "vodka eyeballing" resulted in 2 main picks of search, in May 2010 (greater pick, corresponding to the period of the first reports) and in January 2011, mainly localized in the US³³.

Desired Effects

Pouring alcohol directly into the eyeball is considered by misusers an effective way to achieve a more rapid and intense effect of alcohol (a "quick high") by absorbing it through the "mucous membrane and veins at the back of the eye"^{4,16,30,34} while avoiding the "alcoholic fetor" associated with its oral ingestion⁴. Other relevant reported psychological motivations are competition among peers and novelty seeking^{4,16,19,30}.

Unwanted Effects

Local effects of alcohol eyeballing include pain, burning, blurred vision, conjunctival injection, corneal ulcers or scarring, permanent vision damage and eventually blindness^{19,22,25,30,34,35}. Systemic unwanted effects are those of ethanol intoxication, including incoordination, slurred speech, attention impairment, anterograde amnesia, aggressiveness and potentially coma and death¹. However, while the local effects represent a frequent and actual concern, the ethanol intoxication is a rare possibility given the small amounts that can be introduced by the eye.

Discussion

To the best of our knowledge, this work constitutes the first report on alcohol eyeballing. During the last decade, new drug trends have emerged among adolescents and young adults favored by the ability of the Internet to disseminate information and products quickly and efficient-

ly^{12,36,37}. The present work represents an overview of distribution, motivational bases, and physical effects of a new way of alcohol consumption consisting in pouring alcoholic substances directly into the eyes.

Since 2010, when the first reports appeared on the Web, alcohol eyeballing has been encountering growing popularity among students^{4,16,19,30}. Although the exact origin remains unknown, American colleges or university campuses in UK seem to be the places where this phenomenon first arose^{4,16,25}. Other anecdotal reports claim that alcohol eyeballing would have started as a nightclub trick performed by bar attenders willing to increase they tips in the US, especially in Las Vegas¹⁶.

The main objective of “eyeballers” is to obtain a more rapid and intense effect of alcohol, a “quick high”, short-circuiting the hepatic passage and the degradation by the enzyme system (as other misusers do with other substances like N,N-Dimethyltryptamine^{12,25,38}). This is partially true: systemic absorption of topical solutions in the eye occurs through two pathways, the conjunctival mucosa and the nasopharyngeal mucosa which communicates with the eye surface through the nasolacrimal duct³⁹. However, the volume of alcohol absorbed by the eye is very limited and unable to cause the “quick high” effect. In fact, the average normal tear volume is 6.2 microliters⁴⁰, while drop volume varies between drug manufacturers, ranging from 33.8 microliters to 63.4 microliters⁴¹. This means that when instilling eye drops, one single drop has the maximum volume that the eye can hold. Any exceeding volume can still reach the nasopharyngeal mucosa passing the nasolacrimal duct, but, the punctal openings in the eyelid are 0.3 mm in diameter and the volume drained with each blink is approximately 2 microliters⁴². Thus, if a shot, a glass or a bottle of vodka is poured on an eye, the major part of the liquid simply spill out of the ocular surface. Moreover, pain and irritation due to ethanol toxicity produce a strong defensive reflex causing hypersecretion and, thus, tearing⁴³. This contributes to alcohol dilution and elimination. Therefore, eyeballing do not really make the abusers “drunk”, but rather represents a psychological way to enhance the psychedelic effects of orally ingested alcohol.

Other driving forces encouraging young students to engage in this harmful practice are competition among peers and novelty seeking^{4,16,19,26,30}; to this respect this bizarre way to

misuse alcohol may be considered at the same level of other dangerous and trendy games of the moment, such as “balconing”, “choking”, “planking”, “batmanning”, and “owling”⁵. Some reports indicate alcohol eyeballing as an initiation ritual performed to enter a new group⁴⁴. In relation to this issue, a user anecdotally reported that “*It was really painful. But bearing the pain is part of the competitiveness*”⁴⁵. The pain induced by the eyeballing is actually severe and sharp, as the cornea receives one of the densest sensory innervations of all the body, which is exclusively composed from small-fiber nociceptive (pain-sensing) neurons³⁹.

Recent experimental studies demonstrated that the exposure of human corneal epithelial cells to incremental concentration (20% to 100%) of ethanol for 30 seconds determines cell lysis, apoptosis, and reduced proliferation in a concentration-dependent manner⁴⁶. In addition, significant damage to the corneal epithelial tight junctions⁴⁷ and increased expression of proinflammatory cytokines and chemokines⁴⁶ have been observed after exposure of the cornea to 20% alcohol. About this point, data suggest that brief exposure of corneal cells to ethanol may lead persistent inflammation of the ocular surface. Ocular surface inflammation is a main pathogenic factor for ocular surface disorders including dry eye syndrome^{46,48}.

The epithelium is the layer of cells that cover the surface of the cornea. It is only about 5-6 cell layers thick and quickly regenerates when the cornea is injured. If the injury penetrates more deeply into the cornea, it may leave a scar. Scars leave opaque areas, causing the corneal to lose its clarity and luster, resulting in decreased visual acuity. Also, it is possible that exposure of the corneal limbal area to ethanol may deplete epithelial progenitor cells (stem cells) and cause permanent failure of corneal epithelial regeneration⁴⁶. In addition, if the alcohol-induced destructive process reaches those anatomical structures designated to the production and outflow of aqueous humor, other ophthalmologic disorders such as glaucoma could potentially occur.

Interestingly, for its ability to damage corneal epithelial cells and facilitate corneal epithelial debridement, diluted ethanol is used in ophthalmology for treating some pathological conditions, such as infectious keratitis and recurrent corneal erosion or for removing corneal epithelium during excimer laser refractive surgery⁴⁹⁻⁵¹.

It is, thus, conceivable that the direct contact of corneal epithelial cells with substances with high ethanol content may have long-term permanent effects. For this reason the American Academy of Ophthalmology officially advised the public to not engage in this alcohol eyeballing practice¹⁷.

From a clinical perspective, being aware of the existence of alcohol eyeballing and knowing its presentation may help physicians in emergency departments, ophthalmologists, and other healthcare professionals to recognize it promptly and to select adequate interventions. From a psychiatric point of view, it is known that binge-type drinking such as alcohol eyeballing is a crucial step in adolescents' progression to several other psychiatric problems such as alcohol abuse and dependence, addictions, sleep, mood and anxiety disorders^{7-11,52}. For this reason, this maladaptive form of recreational alcohol use among adolescents should not be underestimated.

One could wonder about the limitations of carrying out a risk of misuse assessment of a drug whilst taking into account the online comments; in fact, it may be inappropriate to trust information obtained from the Internet without independent verification. However, in presence of very limited relevant peer-reviewed data, this seems to be the only method to obtain preliminary information about new and emergent phenomena⁵³⁻⁵⁵.

Conclusions

Alcohol eyeballing represents a new alerting trend among adolescents and young adults with potential permanent adverse effects, deserving the attention of families and healthcare professionals. Larger observational studies are warranted to estimate the prevalence, characterize the effects, and identify adequate forms of interventions for this emerging phenomenon.

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Conflict of Interest

All the authors of this paper have no relevant affiliations or financial involvement with any organization or entity with a financial interest in, or financial conflict with the subject matter or materials discussed in the manuscript. This includes employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties. All authors acknowledge that the conflict of interest disclosures are complete for both themselves and their co-authors, to the best of their knowledge.

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