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Review Article

Binge drinking and the risks to adolescent health

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Abstract

Adolescence is a phase characterized by physical, emotional and social changes that make adolescents more susceptible to risky practices and behaviors. One of these common practices is excessive alcohol consumption, known as “binge drinking”, which causes numerous acute and chronic health problems. This article presents some characteristics observed in adolescent development and the consequences of excessive alcohol consumption for physical and emotional health, and its repercussions on community life.

Keywords: Adolescence, Alcohol, Binge Drinking, Adolescent Health

Introduction

Adolescence is a phase characterized by physical, emotional, cognitive and social changes which comprises the transition from childhood to adulthood. In addition to puberty and other physiological events, the growth and development of the central nervous system also are occurring in adolescence, allowing us to understand the multiple characteristics of adolescents throughout this period, such as impetuosity, feeling of invulnerability and the search for immediate rewards. Such characteristics make adolescents more vulnerable to various events such as unintentional injuries, exposure to illicit drugs and excessive alcohol consumption.¹⁻²

In turn, alcohol is the most widely used and socially accepted psychoactive agent in the world, with intoxicating and dependency-generating properties, consumed by more than a third of the world's population, being responsible for around 3 million deaths every year, equivalent to 4% of all deaths in the world³. Excessive alcohol consumption is a serious public health problem and is associated with multiple and harmful social and health consequences.

One of the most common forms of alcohol consumption today is the so-called binge drink (BD) or “heavy episodic consumption”, characterized by the consumption of at least four doses of alcohol on a single occasion, for women, and five doses for women. men, which leads to a blood ethanol concentration greater than 0.08% or 0.08g/dL, consumed in 2 hours. Such behavior is most observed among adolescents and young adults⁴, with prevalence reaching more than 30% in this age group in USA⁵ and European countries.⁶

BD has been associated with numerous acute and long-term problems, including alcohol-related accidents and toxicity, alcohol dependence, mental and physical health problems, interpersonal relationship difficulties, and increased likelihood of involvement in risky sexual behavior, accidents and violent situations. In this context, adolescents are at increased risk due to the impacts of using this substance during a critical period of body growth and development, especially the brain.⁷

Effects of alcohol on the body

The physical and emotional effects observed in alcohol consumers are caused by ethanol metabolites, mainly acetaldehyde, which is a toxic substance that causes changes of different magnitudes in all organs and systems of the human body⁸.

Generally, some short-term health effects of excessive alcohol consumption may include nausea, vomiting, headache, abdominal pain, diarrhea, bradycardia, reduction in body temperature, respiratory changes, drowsiness, slow or monotonous responses to stimuli, loss of coordination, impaired judgment and risky behaviors.⁹

Over time, continued binge drinking can increase the risk of several chronic illnesses or other serious long-term problems. The consequences of excessive alcohol consumption on different systems and structures will be presented below.

Consequences of adolescent binge drinking

The central nervous system is the main structure that can suffer serious consequences due to excessive alcohol consumption

and irreversibly compromise future life. During the ongoing process of brain maturation that occurs in adolescence, excessive alcohol consumption can result in potentially long-lasting neural changes at the cellular, structural, functional and cognitive levels. These changes can manifest themselves as a possibility of reducing gray matter volume ¹⁰, reduced neurogenesis, changes in synaptic functions and neurotransmitter systems ¹¹, changes in functioning related to the regulation of impulsive behaviors and of risk ¹² changes in

mood and behavior and difficulties in maintaining postural balance, changes in emotional processing ⁹ and high risk of developing future alcohol dependence. ¹²⁻¹⁴.

Due to its diffusion throughout the body, alcohol can cause damage of varying intensity to different tissues and systems. The other effects of alcohol on the body are shown in the table 1.

Table 1. Effects of alcohol on different organ/structures body of the body

organ/system	effects
Heart and cardiovascular system	Cardiomyopathy, cardiac fibrosis, ischemia, congestive cardiac insufficiency, changes in heart rhythm with atrial fibrillation and other arrhythmias, high blood pressure, strokes and hypertension ¹⁷⁻¹⁹
Lungs	Lower levels of nitric oxide in the lungs, which can make breathing more difficult; oxidative stress and diminished lung host defense mechanisms ²⁰⁻²¹
Oral cavity	Increased likelihood of periodontal disease, cavities, tooth wear and halitosis, in addition to the risk of developing cancer in the oral cavity, oropharynx, larynx and esophagus ²²⁻²³
Liver	Fatty liver, alcoholic hepatitis, fibrosis and cirrhosis and portal hypertension ²⁴⁻²⁵
Gastrointestinal tract	Esophageal and gastric dysmotility, gastritis and mucosal atrophy ²⁶⁻²⁷
Pancreas	The pancreas produces toxins, which can lead to increased inflammation and pancreatitis ²⁸
Immune System	Immune system is depressed in the 24 hours following a binge with susceptibility to flu, pneumonia, tuberculosis, and COVID-19 ²⁹⁻³⁰
Intestine	Alcohol-induced dysbiosis and barrier dysfunction; changing the intestinal microbiota composition and/or function; impaired intestinal nutrient absorption, disruption of lymphatic function, and increased bacterial toxin translocation ^{19;31}
Musculoskeletal system	Disruption of bone remodeling ¹⁹
Others	Cancer of the breast (among females), liver, colon, rectum, mouth, pharynx, larynx, and esophagus ²³

Effects of alcohol on social relationships

In addition to causing various health risks, excessive alcohol consumption is related to a lot of social problems, also resulting in serious consequences and high costs for the individual and the entire community. Adolescents who adopt this type of alcohol consumption are predisposed to suffering unintentional injuries (falls, burns and motor vehicle accidents), may become involved in violent situations (intimate partner violence, homicide, suicide, sexual assault) ³², greater exposure to sexually transmitted diseases, unwanted pregnancy and abortion, tendency to start using illicit drugs ³³⁻³⁵. Such conditions can lead to the loss of days of school activities and the absence or reduction of productive capacity.

Another very common practice among teenagers is to consume a mixture of energy drinks and alcohol, the mixture of which causes, among other changes, a false subjective sensation of alertness, which can lead to increased alcohol consumption and increase the harmful effects on the body ^{36,37}.

Preventing binge drinking

In view of all the problems presented above, preventing alcohol consumption must be considered a priority and multidisciplinary activity, which requires the involvement of the family and the community who must adopt different strategies adapted to the characteristics and social conditions of adolescents, identifying their priorities and needs, promoting integrative and support actions. ³⁸.

Actions aimed at prevention must develop educational programs with the participation of family members, promote lectures and discussion groups on the harm caused by alcohol,

and widely publicize the risks to which they are exposed and the consequences for alcohol consumers. ^{39,40}.

Furthermore, at a broader community level, some strategies can be adopted such as: updating legislation to increase the illegal consumption of alcoholic beverages, limiting points of sale in areas most frequented by teenagers, limiting sales days and times, increasing alcohol taxes and hold alcohol retailers liable for damages caused by the illegal sale of alcoholic beverages to minors or intoxicated customers.

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