

Alcohol consumption during adolescence: A link between mitochondrial damage and ethanol brain intoxication

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Adolescence is a period of multiple changes where social behaviors influence interpersonal-relations. Adolescents live new experiences, including alcohol consumption which has become an increasing health problem. The age of onset for consumption has declined in the last decades, and additionally, the adolescents now uptake greater amounts of alcohol per occasion. Alcohol consumption is a risk factor for accidents, mental illnesses or other pathologies, as well as for the appearance of addictions, including alcoholism. An interesting topic to study is the damage that alcohol induces on the central nervous system (CNS) in the young population. The brain undergoes substantial modifications during adolescence, making brain cells more vulnerable to the ethanol toxicity. Over the last years, the brain mitochondria have emerged as a cell organelle which is particularly susceptible to alcohol. Mitochondria suffer severe alterations which can be exacerbated if the amount of alcohol or the exposure time is increased. In this review, we focus on the changes that the adolescent brain undergoes after drinking, placing particular emphasis on mitochondrial damage and their consequences against brain function. Finally, we propose the mitochondria as an important mediator in alcohol toxicity and a potential therapeutic target to reduce or treat brain conditions associated with excessive alcohol consumption. © 2017 Wiley Periodicals, Inc.

adolescence

alcohol

alcoholism

binge-drinking

mitochondria

oxidative stress

alcohol

antioxidant

neurotransmitter

prostaglandin synthase

reactive oxygen metabolite

voltage dependent anion channel

alcohol

adolescent

alcohol consumption

alcohol intoxication

alcohol withdrawal syndrome

alcoholism

binge drinking

body temperature

brain cell

brain function

brain intoxication

calcium homeostasis

cell damage

cell death

central nervous system

central nervous system depression

cerebellum

consciousness disorder

emotional disorder

hangover

hippocampus

human

mental disease

mitochondrial damage

mitochondrial membrane

mitochondrial permeability

oxidative stress

perception

physical capacity

public health problem

Review

risk factor

synapse

alcohol intoxication

brain

drinking behavior

drug effect

mitochondrion

pathology

social behavior

Adolescent

Alcohol Drinking

Alcoholic Intoxication

Brain

Ethanol

Humans

Mitochondria

Risk Factors

Social Behavior