Single Episode Of Binge Drinking Linked To Gut Leakage and Immune System Effects

A single alcohol binge can cause bacteria to leak from the gut and increase levels of bacterial toxins in the blood, according to a study funded by the National Institutes of Health.

Increased levels of these bacterial toxins, called endotoxins, were shown to affect the immune system, with the body producing more immune cells involved in fever, inflammation, and tissue destruction.

Binge drinking is defined by NIAAA as a pattern of drinking alcohol that brings blood alcohol concentration (BAC) to 0.08g/dL or above. For a typical adult, this pattern corresponds to consuming five or more drinks for men, or four or more drinks for women, in about two hours.

Some individuals will reach a 0.08g/dL BAC sooner depending on body weight.

Binge drinking is known to pose health and safety risks, including car crashes and injuries. Over the long term, binge drinking can damage the liver and other organs.

"While the negative health effects of chronic drinking are well-documented, this is a key study to show that a single alcohol binge can cause damaging effects such as bacterial leakage from the gut into the blood stream," said Dr. George Koob, director of the National Institute on Alcohol Abuse and Alcoholism, part of NIH.

The study was led by Gyongyi Szabo, M.D., Ph.D., Professor and Vice Chair of Medicine and Associate Dean for Clinical and Translational Sciences at the University of Massachusetts Medical School. The article appears online in *PLOS ONE.*

In the study, 11 men and 14 women were given enough alcohol to raise their blood alcohol levels to at least .08 g/dL within an hour. Blood samples were taken every 30 minutes for four hours after the binge and again 24 hours later.

The researchers found that the alcohol binge resulted in a rapid increase in endotoxin levels in the

blood and evidence of bacterial DNA, showing that bacteria had permeated the gut. Endotoxins are toxins contained in the cell wall of certain bacteria that are released when the cell is destroyed. Compared to men, women had higher blood alcohol levels and circulating endotoxin levels.

"We found that a single alcohol binge can elicit an immune response, potentially impacting the health of an otherwise healthy individual," said Dr. Szabo. "Our observations suggest that an alcohol binge is more dangerous than previously thought."

Earlier studies have tied chronic alcohol use to increased gut permeability, wherein potentially harmful products can travel through the intestinal wall and be carried to other parts of the body. Greater gut permeability and increased endotoxin levels have been linked to many of the health issues related to chronic drinking, including alcoholic liver disease.

Source: National Institute on Alcohol Abuse and Alcoholism (NIAAA)