More Liquor—Better Ticker?

By Gail Gorman

Studies conducted around the world over the past three decades or so might seem to indicate that moderate drinking may lower the risk of coronary artery disease and ischemic stroke, which are characterized by blocked blood vessels that supply oxygen to the brain.1 Those same studies, however, also warn that the risk of bodily damage goes up dramatically as people drink beyond moderate limits and even more so if they drink to excess with any regularity.

The amount considered "moderate" is three standard-sized cans of beer (12 fluid ounces) or 15 ounces of wine, not three snifter-sized glasses of wine filled to the brim. For distilled spirits, moderate means three ounces "shots."

Overdrinking can directly damage the heart muscle cells, and breathlessness and fatigue may be early signs. Among the risks associated with overdrinking are hypertension, cardiac arrhythmias, liver damage (Editor's note: see Nutrition Health Review #83), shrinkage of the brain,2 enlargement of the pancreas (Editor's Note: see Nutrition Health Review #83), and forgetfulness.

Study findings are controversial for two reasons:

First, the findings affect both the leading cause of death (heart disease) and the third leading cause (stroke).9 Together those two killers constitute about 40 percent of all deaths annually.

Would a few drinks save those people? No. Sixty percent of all heart-related deaths and 25 percent of all deaths in general in the U.S. are attributed to these two conditions alone. These findings are significant.

Second, because alcohol increases the turnover of norepinephrine and dopamine as well as the production of beta-endorphin in the hypothalamus, and because it stimulates increased transmission of the nerve transmission inhibitor GABA, it generally impairs our judgment.10 Therefore, we do not consider our intake seriously; we erroneously consider it harmless.

If our brain chemistry in good working order, however, we might recognize just how serious a drug alcohol is. For example, binge drinking tends to result in more abdominal fat and is an important risk factor for cardiovascular disease.4 People who consume alcohol sporadically but intensely—more than three to four drinks per occasion—have the highest levels of abdominal fat, compared with even those who drink regularly but moderately. In a 2001 survey, approximately 20 percent of respondents aged 12 or older reported that they participated in binge drinking at least once in the 30 days prior to the survey.5

People who drink excessively are generally unable to absorb vitamin B1 because of damage to the digestive system. Prolonged vitamin B1 deficiency is generally marked by impaired memory, confusion, lack of coordination, amnesia, apathy, and disorientation.6 Excessive drinking also leads directly to fatty liver, alcoholic hepatitis, and cirrhosis of the liver, a condition that affects 10 percent of long-term alcohol abusers. Because of the irreversible damage caused, people with cirrhosis usually die within five years.7

As for the progression of drinking to overdrinking, a little leads to a lot very easily. Here are a few examples of blood alcohol content and their effects:8

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Alcohol Consumption Linked to Breast Cancer

According to the October 2003 issue of Cancer Epidemiology, Biomarkers, and Prevention, an increase in hormonally sensitive breast cancer in older women is linked to alcohol consumption.

The study, consisting mainly of interviews with nearly 2,000 women between 65 to 79 years of age, found that postmenopausal women who drank two or more alcoholic beverages a day had a significantly higher risk of breast cancer than did nondrinkers. Half of the women surveyed had a history of breast cancer, and half did not.

Drinking two or more alcoholic beverages a day marked a 330 percent greater risk of lobular cancer, a 50 percent increased risk of ductal cancer, and a 40 percent increased risk of estrogen-receptor and progesterone-receptor positive breast cancers.

Results suggest that the breast cancer risk might be the product of increased estrogen levels in the blood as a result of the alcohol.

Alcohol Inhibits Key Brain Proteins

Although scientists have known for years that cocaine, marijuana, and heroin interact with specific proteins in the brain, they have traditionally thought that alcohol had no such pointed effects.

Now University of North Carolina at Chapel Hill researchers have found evidence that alcohol inhibits the actions of key proteins called N-methyl-D-aspartic acid (NMDA) receptors in specific regions of the brain.

"NMDA receptors in the brain are key sites of action of the neurotransmitter glutamate, which increases the activity of brain neurons," said lead author Dr. Darin J. Knapp, research professor of psychiatry at the university's School of Medicine. "Earlier investigations have shown that alcohol-NMDA interactions influence many features of alcohol exposure, including effects on fetal development, seizures, gene expression in brain, intoxication, tolerance to ethanol, and alcohol dependence."

The new study sought to induce and block Fos protein in brain as measured with Fos-like immunohistochemistry (Fos-LI). Dr. Knapp said Fos proteins are known to reflect changes in cellular activity and participate in regulating gene activity.

Measurement of Fos-LI is a form of brain mapping that allows researchers to identify and note brain regions that change their activity after different challenges, such as alcohol consumption, he said.

Alcohol's main effect was to inhibit or prevent NMDA-induced Fos protein induction, Dr. Knapp said. That means Fos protein induction by NMDA—and the blockage caused by alcohol—occurred in specific brain regions such as the prefrontal cortex and the hippocampus, which are essential for memory formation and higher mental functions.

"Our findings provide new evidence for the interaction of alcohol with specific neurotransmitter receptors of the living brain," he said, and noted that the results should contribute to a clearer picture of how alcohol affects the brain and leads to addiction.

He mentioned that a significant part of the motivation for the work at the Bowles Center for Alcohol Studies comes from the understanding that alcoholism is a brain disease with a neurobiological basis, not a moral failure or a lack of willpower.

NMDA receptors have gained special attention in regard to memory, said Dr. Andrey Ryabtchik, assistant professor of behavioral neuroscience at the Oregon Health Sciences University.

"One of the features of alcoholism and drug addiction is the formation of habits," Dr. Ryabtchik said. "There could therefore be a common link between becoming an alcoholic and developing, or learning, an alcohol-related habit, and NMDA receptors could be involved in this."