



Alcohol and the body

Dr Craige Golding

Specialist Physician & Anti Aging Physician.

MBChB (Cum Laude, Pretoria); FCP(SA) Specialist physician/Internist; ABAARM: Board Certified Anti-Aging Physician – American Board of Anti-Aging and Regenerative Medicine; FAARFM: Advanced Fellowship in Anti-aging, Regenerative and Functional Medicine. FICT: Fellowship in Integrative Cancer Therapies; ACAM: Certified Chelation Therapist (American College of Advancement in Medicine); MS (USF): Masters in Medical Sciences, University of South Florida (completing Nov. 2010). Faculty member AAAM (American Aesthetics and Antiaging Society): International lecturer. Medical Director: SOLAL Technologies. Director of Fellowship Teaching Program: SA4IM (South Africa Academy of Anti-Aging and Integrative Medicine).

There is a limit to the amount of alcohol anyone can process in a given time (approximately 1oz. per hour). Women metabolize alcohol at a slower rate than men. This limit is set by the number of molecules of the enzyme alcohol dehydrogenase that reside in the liver.

- The type of enzyme produced varies with individuals depending on their genes.
- Alcohol interferes with the distribution of nutrients and oxygen to the liver cells.
- Alcohol causes the stomach cells to over secrete histamine and acid.
- Intestinal walls fail to absorb thiamine, folic acid, vitamin B6 and vitamin B12.
- Liver cells lose efficiency in activating vitamin D.
- Deficiencies of protein develop.
- Lipoprotein synthesis is accelerated increasing blood triglyceride levels.
- The body's immune system is compromised.
- The kidneys excrete increased quantities of magnesium, calcium, potassium and zinc. This predisposes one to osteoporosis.
- Amino acid metabolism in the liver is altered.
- Rod cells in the eyes are affected.
- Alcohol interferes with medications.
- There is a dangerous shift in the acid-base balance toward acid.

Why people get addicted to alcohol - lack of endorphins

Recent research reveals that a subject's brain with low beta-endorphin levels becomes accustomed to the presence of an exogenous surplus, diminishing its own supply and triggering dependence on an external source - in this case, alcohol.

According to a study by scientists "Alcoholism and drug addiction", of the University of Granada, researchers have shown that the lack of endorphins is hereditary, and thus there is a genetic predisposition to become addicted to alcohol.

Beta-endorphin is a kind of "morphine" released by the brain in response to several situations, such as pain. In this way, beta-endorphins can be considered "endogenous analgesics" to numb or dull pain.

Researchers have focused on the low beta-endorphin levels in chronic alcohol abusers. According to José Rico Irlés, professor of Medicine of the UGR, and head of the research group, this low beta-endorphin level determines whether someone may become an alcoholic. When a subject's brain with low beta-endorphin levels gets used to the presence of an exogenous surplus, then, when its own production stops, a dependence starts on the external source: alcohol.

Who may become an alcohol abuser?

A total of 200 families of the province of Granada participated in the research. There was at least one chronic alcoholic parent in each family. From birth, each subject presented predetermined beta-endorphin levels. However, children of this population group aged between 6 months and 10 years old, registered lower beta-endorphin levels than other children of the same age. "These levels were even lower in children whose both parents were alcohol abusers", the researcher states.

According to the researcher, although alcohol consumption does not affect all people in the same way, differences in endorphin levels make some subjects more vulnerable to alcohol. Therefore, they are more likely to become alcohol dependent.

Beta-endorphins constitute a useful biological marker to identify specifically those subjects who have a higher risk of developing alcohol abuse, the research claims.

Regarding the results of this study, professor Rico states the following: "alcohol-abuse prevention must consist of locating and identifying genetically predisposed subjects." More campaigns for children and teenagers should be launched before these young people make contact with



alcohol. Alcohol awareness is fundamental to prevent addiction, the researcher affirms, because alcohol is a drug with reversible effects up to a point.

In relation to the “botellón culture” (Botellón is a Spanish custom in which young people congregate in a park, street or any open public place to share alcoholic drinks and converse before entering bars, nightclubs, discos, etc.), José Rico states that some of these “social drinkers” could have low beta-endorphin levels and, therefore, a higher predisposition to become “solitary drinkers” and to develop alcohol abuse.

<http://www.ugr.es/Alcohol and the Liver>

During first-pass metabolism of alcohol, the coenzyme nicotinamide adenine dinucleotide (NAD) is converted to its reduced form, NADH. NAD and NADH are compounds involved in the synthesis of the energy molecule adenosine triphosphate (ATP) within the mitochondria. Production of excess NADH upsets the delicate reduction/oxidation, or redox, balance in liver cells.

Excess alcohol ingestion promotes fatty acid synthesis, causing a rise in liver fatty acid content. This saturates the liver with lipids, causing “fatty liver,” or steatosis, a first step on the path to more serious liver disease. Elevation of blood lipids, including high-density lipoprotein (HDL), may also occur.

In recent years, the mild increase in HDL induced by alcohol has been touted as playing a beneficial role in the reduction of cardiovascular disease and incidence of stroke. But alcohol’s other effects are less benign.

The acetaldehyde produced during alcohol metabolism is a mutagenic agent, capable of producing harmful genetic mutations that may trigger various cancers. Some of alcohol’s worst effects, however, are caused by the free radicals produced as a result of its metabolism. These rogue molecules steal hydrogen ions from fatty acids in the cell membranes, triggering a chain reaction that damages or destroys cell membranes, a process referred to as lipid peroxidation.

Metabolism of alcohol provokes a striking increase in the activity of cytochrome P450 liver enzymes, especially a subset enzyme known as 2E1. Studies show that 2E1 liver enzymes are four to 10 times higher in people who have recently consumed alcohol than in non-drinking controls. This liver enzyme converts various compounds to highly toxic metabolites. One consequence of drinking, there-

fore, is the production of toxic metabolites that would otherwise not occur. For example, many pesticides are normally converted to non-carcinogenic compounds in the livers of non-drinkers. But among alcohol drinkers, they are converted to carcinogens—compounds known to have cancer-promoting properties.

Alcohol and the brain

What they have found, however, is plenty of evidence showing structural damage in the brain as well as other detrimental effects, even when consumed in small quantities.

I think that is far more telling than anything else. It is hard to imagine any significant health benefit that could outweigh its destructive influence on the brain.

Although some research points to the possibility that moderate alcohol consumption may actually reduce your risk of dementia, numerous studies clearly indicate that alcohol consumption causes too many directly negative neurological complications to say that it has any real benefit.

How Alcohol Damages Your Brain

In the study mentioned above, researchers discovered that creatine and choline concentrations in the brain decrease as the concentration of alcohol increases. Creatine is involved in energy metabolism and protects brain cells, and choline is a component of cell membranes.

Researcher Armin Biller said, “*That probably indicates that alcohol triggers changes in the composition of cell membranes. Our follow-ups on the next day showed that the shifts in brain metabolites after moderate consumption of alcohol by healthy persons are completely reversible. However, we assume that the brain’s ability to recover from the effect of alcohol decreases or is eliminated as the consumption of alcohol increases. The acute effects demonstrated in our study could possibly form the basis for the permanent brain damage that is known to occur in alcoholics.*”

Another recent study published in the April issue of Human Psychopharmacology addresses the chronic effects of low to moderate alcohol consumption on the structural and functional properties of the brain.

Using Magnetic Resonance Induction (MRI) studies, they found a linear negative effect of alcohol consumption on brain volume. They concluded that the brain shrinkage reported as a result of low to moderate alcohol consumption offers more support for the contention that alcohol



is, overall, more detrimental than beneficial to the brain's health and cognition.

Yet another study published in the March/April issue of *Alcohol & Alcoholism* adds to the most recent lineup of studies linking regular alcohol consumption with various forms of brain damage.

In that study the researchers concluded that: "Even heavy social drinkers who have no specific neurological or hepatic problems show signs of regional brain damage and cognitive dysfunction. Changes are more severe and other brain regions are damaged in patients who have additional vitamin B1 (thiamine) deficiency (Wernicke-Korsakoff syndrome)."

Other Health Hazards of Alcohol Consumption

My position is that it is never a good idea to drink alcohol. After all, alcohol is a neurotoxin - it can poison the brain. Even moderate amounts of alcohol are not recommended, because alcohol can also:

- Make one more vulnerable to various preventable cancers.
- Harm the body's delicate hormonal balance.
- Cause liver damage.

It goes without saying that alcohol should be entirely avoided during pregnancy as it can cause severe damage to the unborn child.

In addition, alcohol consumption has also been found to blunt the responsiveness of the hypothalamus to immune- and other non-immune signals. An impaired physical stress response is believed to affect several body systems, including the immune system's ability to fight infection, and, again, can hinder the brain cells' ability to learn and remember.

What About Red Wine?

Red wine is often cited as being a good source of resveratrol, a potent antioxidant that has been shown to increase lifespan in a manner similar to calorie restriction. But what is frequently overlooked is the fact that there are many other, far safer sources of resveratrol.

For example, instead of red wine, one can use a grape seed supplement. Because although resveratrol is found in grapes, it is likely that there are other accessory micronutrients and trace elements that enhance resveratrol's benefits, so taking the entire whole unprocessed food (minus the carbohydrate loaded sweet pulp) will provide the most benefit.

Resveratrol is also found in raspberries, mulberries and peanuts.

Other potent sources of antioxidants include grape pomace, blueberries, and green tea.

Red wine is definitely NOT the best source of antioxidants, as some studies would suggest. There are major benefits to consuming the bioflavonoids that are present in grape seeds and grape skins, but NOT in the alcohol caused by fermenting the sugar in the grape pulp.

Consuming large amounts of wine will also increase insulin levels, which will eventually have a negative impact on health.

Treatment options for alcoholism

"Niacin is the single most important treatment for alcoholism, and it is one of the most reliable treatments. And it is safe, much safer than any of the modern psychiatric drugs. Niacin does not work as well when alcoholics are still drinking but in a few cases it has decreased the intake of alcohol until they were abstinent. This conclusion is based on the work my colleagues and I have done since 1953.

"I know of many alcoholics who did not want to stop drinking, but did agree to take niacin. Over the years, they gradually were able to reduce their intake until they brought it under control. Some alcoholics can even become social drinkers on a very small scale. I have not found many who could. But I think that if started on the program very early, many more could achieve normalcy. I suspect that treatment centers using those ideas will be made available one day, and will be much more successful than the standard treatment today. This all too often still consists of dumping them into hospitals and letting them dry out, with severe pain and suffering. When they are discharged, most go right back to the alcohol, the most dangerous and widely used street drug available without a prescription.

"Orthomolecular treatment is the treatment of choice. The following protocol for alcoholism outlines the importance of the nutritional factors that have been shown to be very successful in treating this condition. The treatment can be used alone but is best combined with dietary advice and additional nutrients."

The late Dr. Roger Williams, a chemistry professor at the University of Texas and former president of the American Chemical Society, also wrote extensively on the alcohol-



ism. Dr. Williams recommended large doses of vitamins and an amino acid called L-glutamine.

What should the alcoholic do to help stop drinking and return his or her body to normal functioning? Supply the following nutrients to the body:

- Vitamin C to saturation (on the order of 10,000 to 20,000mg per day and more). High doses of vitamin C chemically neutralize the toxic breakdown products of alcohol metabolism. Vitamin C also increases the liver's ability to reverse the fatty build-up so common in alcoholics.
- To titrate to saturation, take 1000mg of vitamin C every hour. When saturation is reached, there will be a single episode of diarrhoea; then reduce the dosage to 1000mg every four hours.
- A B50-complex tablet (comprising 50mg of each of the major B-vitamins, 6 times daily).
- L-Glutamine (2000 or 3000mg). L-Glutamine is an amino acid that decreases physiological cravings for alcohol. It is one of the two primary energy providers that burn glycogen to provide fuel to the brain and stimulates many neurofunctions. L-Glutamine is naturally produced in the liver and kidneys. Alcohol harms the kidneys and liver, thus supplementation is vital (concurrently reducing cravings for sugar and alcohol).
- Lecithin (2 to 4 tablespoons daily). Provides inositol and choline, related to the B-complex. Lecithin also helps mobilize fats out of the liver.
- Chromium (at least 200 to perhaps 400mcg chromium polynicotinate daily). Chromium greatly reduces carbohydrate mis-metabolism, and greatly helps control blood sugar levels. Many, if not most, alcoholics are hypoglycemic.
- A good high-potency multi-vitamin, multi-mineral supplement as well, containing magnesium (400mg) and the antioxidants carotene and d-alpha tocopherol.

In summary, the alcoholic's body needs the proper nutrients in adequate quantities to return to normal metabolic functioning. The above nutrients are safe, effective, inexpensive and available from discount stores or health food stores without prescription. There is not even one death per year from vitamins. Pharmaceutical drugs, properly prescribed and taken as directed, kill over 100,000 Americans annually. Hospital errors kill still more. Most illness is due fundamentally to malnutrition. This not only includes the chronic diseases, but also viral and bacterial acute illness, which are greatly aggravated by inadequate nutrition. Supplements are not the problem; they are the solution. Malnutrition is the problem.