

A new study shows that binge drinking by teenagers may increase the possibility of osteoporosis in later life. Researchers in the United States say drinking a lot of alcohol over a short period may influence genes involved in bone formation.

Bone biologist John Callaci led a team studying the effects of alcohol on young rats. He teaches and leads a research laboratory at Loyola University's medical school in the state of Illinois. His team's findings appear in "Alcohol and Alcoholism," a publication of Oxford University Press.

Binge drinkers swallow large amounts of alcohol over a short period. One definition says binge drinking happens when a woman has at least four alcoholic drinks in a hurry. For men, binge drinking can mean five drinks in a short time.

America's Substance Abuse and Mental Health Services Administration says binge drinking can begin when a person is about thirteen years old. It says binge drinking generally worsens in young adulthood, and slowly decreases after that.

Professor Callaci's team studied adolescent laboratory rats to learn the effects of binge drinking on their genes. The team injected alcohol into the animals. The injections resulted in a blood alcohol level of zero-point-two-eight. In many American states, a person is legally drunk when the level of alcohol in the blood reaches zero-point-zero-eight.

Some rats received a daily injection of alcohol for three days. The researchers say the alcohol affected about three hundred bone-related genes in those rats. The other rats received alcohol over a similar three-day period, but the injections continued for four consecutive weeks. In these rats, one hundred eighty genes were affected.

The injections added ribonucleic acid, also known as RNA, to the genes of some rats. In the other rats, the RNA in the genes decreased. Ribonucleic acid tells the gene how to make proteins, the substances necessary for bones and other tissues. These changes interfered with the pathway of molecules responsible for building bones and keeping them strong.

Professor Callaci says one of the most worrying findings came thirty days after the injections stopped. At that time, the animals still showed differences in the way their genes were expressed. Thirty days of a rat's life are about the same as three human years.

Professor Callaci says it is not necessarily true that what happens to rats' genes will happen to human genes. But he says the findings suggest that young people's binge drinking could signal problems in their future.

Bones are living tissue. Tissues continually break down and then replace themselves. However, as people get older, more bone breaks down, than gets replaced. The result is that small spaces inside the bone get larger. The shell of the bones also gets thinner.

The word osteoporosis means porous bones, or bones that are not solid enough. The disease harms bones by removing calcium and other minerals from tissue. The National Osteoporosis Foundation says eight of every ten osteoporosis patients are women. It says the disease is most common in Caucasian women over age fifty.

Two years ago, the National Osteoporosis Foundation suggested that doctors extend their list of persons to watch for osteoporosis. The additions included Latina, African-American, Asian and other women. The group also called attention to the fact that men can also suffer from osteoporosis.

Before people develop osteoporosis, they have a condition called osteopenia. Treatment can prevent this condition from becoming osteoporosis. Doctors can identify osteoporosis and osteopenia by measuring the mineral density of a person's bones. In this case, density means the strength of the bones.

Bone mineral density can be measured in a number of ways. Doctors use the tests to examine the hip and spine, or backbone. The National Osteoporosis Foundation says a test called Dual-energy X-ray absorptiometry, or DXA, is the best test for osteoporosis. DXA uses radiation from x-rays. The patient does not get much radiation from the process, which lasts only a few minutes.

Another way to measure bone-density is called peripheral bone mineral density testing. It is often used in the United States to show people if they are in danger of osteoporosis. A moveable machine does the test.

Medical testing companies sometimes perform the exam at an office or other place of business. The exam costs less than the DXA. Peripheral testing measures only one part of the body. Usually that place is the wrist, the heel, or the bones between finger joints.

If the testing device is in good condition, it probably will give satisfactory results. But what if the patient has normal bones in the tested areas, but not in others? A person could appear normal on the test. But she still might have osteoporosis in her backbone or hips.

Bone mineral density in the spine decreases first. A woman's bone mineral density becomes about the same in all parts of her body after she is seventy years old. The lower-cost test may not give complete answers. But it can warn that osteoporosis threatens or has started.

The National Osteoporosis Foundation has advised several steps toward the goal of healthy bones. Its experts say get enough calcium and vitamin D. They say do not smoke or drink too much alcohol. Talk to your doctor about bone health and a possible bone mineral density test.

The National Osteoporosis Foundation says people over fifty should get one thousand two hundred milligrams of calcium every day. It also says this age group should get eight hundred to one thousand International Units of Vitamin D. It says Vitamin D-Two and Vitamin D-Three are both good for bones.

Milk and milk products contain calcium. So do fish with soft bones, like salmon, and dark green leafy vegetables. Some orange juice, bread and cereals may have calcium added.

Some people take pills containing calcium. However, be careful about how much calcium you take. You should not have more than two thousand five hundred milligrams a day. That total includes calcium from food and all other sources. Too much calcium can cause problems like kidney stones.

Vitamin D absorbs, or takes up, calcium. Fish, cereal and milk are rich in Vitamin D. If you spend at least fifteen minutes a day in the sun without a product to block the sun's radiation, you probably get enough Vitamin D.

Several kinds of drugs treat osteoporosis. America's Mayo Clinic medical centers say bisphosphonates are the most popular. Fosamax, Actonel and Boniva are products of this family of drugs.

Doctors who treat osteoporosis patients say physical exercise can help the bones. For active people, lifting weights or playing tennis, slow running and dancing can be helpful.

Some people who have not exercised worry about the effect of exercise on their joints, especially the knees. They are afraid exercise might cause osteoarthritis. In that condition, connective tissue around the bones wears down. One study in The Netherlands shows that might be possible. The results linked knee osteoarthritis to high mechanical strain -- activities that are hard on joints.

Another study found that regular physical exercise does not harm joints. Scientists from Germany and the United States considered earlier research on the effect of exercise on joints. They did not find a link between normal exercise and knee osteoarthritis.