

# Moderate alcohol intake associated with bone protection

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In an epidemiological study of men and post-menopausal women primarily over 60 years of age, regular moderate alcohol intake was associated with greater bone mineral density (BMD). Researchers at the Jean Mayer USDA Human Nutrition Research Center on Aging (USDA HNRCA) at Tufts University found associations were strongest for beer and wine and, importantly, BMD was significantly lower in men drinking more than two servings of liquor per day. The results suggest that regular moderate consumption of beer or wine may have protective effects on bone, but that heavy drinking may contribute to bone loss.

"Previous research suggests that moderate alcohol consumption in older men and post-menopausal women may protect against BMD loss, a major risk factor for osteoporosis," said Katherine L. Tucker, PhD, corresponding author and director of the Dietary Assessment and Epidemiology Research Program at the USDA HNRCA. The 2005 Dietary Guidelines issued by the federal government defines moderate alcohol consumption as one drink per day for women and two drinks per day for men.

"Our study also looks at the possible effects of the three alcohol classes, beer, wine and liquor on BMD," Tucker continued. "We saw stronger associations between higher BMD and beer drinkers, who were mostly men, and wine drinkers, who were mostly women, compared to liquor drinkers." The results were published online February 25 by the *American Journal of Clinical Nutrition*.

Tucker, who is also a professor at the Friedman School of Nutrition Science and Policy at Tufts, and colleagues analyzed BMD measurements taken at three hip sites and the lumbar spine in 1,182 men, 1,289 post-menopausal women, and 248 pre-menopausal women whose parents or in-laws participated in the original Framingham Heart Study. There was not enough data to determine the effects of more than two servings of alcohol per day in post-menopausal women or the effects of daily alcohol consumption on BMD in pre-menopausal women. Participants self-reported their alcohol intake on dietary questionnaires. One serving of beer equaled a glass, bottle or can (356 mL), one serving of wine equaled a 4-oz. glass (118 mL), and one serving of liquor equaled one mixed drink or shot (42 mL).

After adjusting for several other factors that may have accounted for the higher BMD, such as silicon intake, calcium intake and smoking history, the authors still saw an association between higher BMD and moderate alcohol consumption. One of the strongest associations was seen in men who reported consuming one or two servings of total alcohol (a combination of beer, wine and liquor) or one or two servings of beer per day. Hip BMD in this group was significantly greater compared to non-drinkers.

In contrast, the authors observed significantly lower BMD at the hip and spine in men who consumed more than two servings of liquor per day compared to men who consumed one or two servings of liquor per day. "There is a body of research showing alcoholism is devastating to bones," Tucker said. "It's a major risk factor for osteoporosis. No one should depend solely on alcohol to maintain bone health."

The authors hypothesize that the silicon found in beer is contributing to the higher BMD scores in the men who reported consuming one or two servings of total alcohol or beer per day, citing previous studies finding silicon has greater bioavailability as a liquid. It is less clear why liquor

and wine might protect BMD.

"We cannot say definitively what component of these alcoholic drinks might be beneficial to bone health because our findings are from an observational study, as opposed to a clinical trial," Tucker said. "Future studies might dig deeper into patterns of alcohol consumption, as we relied on a self-reported dietary questionnaire. Another component of data worthy of exploration is whether the antioxidants found in wine, such as resveratrol or polyphenols, have a protective effect on bone in addition to other health benefits."

More information: Tucker KL, Jugdaohsingh R, Powell JJ, Qiao N, Hannan MT, Sripanyakorn S, Cupples LA, Kiel DP. American Journal of Clinical Nutrition. February 25, 2009 (online) "Effects of beer, wine and liquor intakes on bone mineral density in older men and women."

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