Replacing white rice with brown rice or other whole grains may reduce diabetes risk

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In a new study, researchers from the Harvard School of Public Health (HSPH) have found that eating five or more servings of white rice per week was associated with an increased risk of type 2 diabetes. In contrast, eating two or more servings of brown rice per week was associated with a lower risk of the disease. The researchers estimated that replacing 50 grams of white rice (just one third of a typical daily serving) with the same amount of brown rice would lower risk of type 2 diabetes by 16%. The same replacement with other whole grains, such as whole wheat and barley, was associated with a 36% reduced risk.

The study is the first to specifically examine white rice and brown rice in relation to diabetes risk among Americans, said Qi Sun, who did the research while at HSPH and is now an instructor of medicine at Brigham and Women's Hospital in Boston. "Rice consumption in the U.S. has dramatically increased in recent decades. We believe replacing white rice and other refined grains with whole grains, including brown rice, would help lower the risk of type 2 diabetes," said Sun.

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Brown rice is superior to white rice when it comes to fiber content, minerals, vitamins, and phytochemicals, and it often does not generate as large an increase in blood sugar levels after a meal. Milling and polishing brown rice removes most vitamins and minerals. In addition, milling strips away most of its fiber, which helps deter diabetes by slowing the

rush of sugar (glucose) into the bloodstream.

The researchers, led by Sun, and senior author Frank Hu, professor of nutrition and epidemiology at HSPH, examined white and brown rice consumption in relation to type 2 diabetes risk in 157,463 women and 39,765 men participating in the Brigham and Women's Hospital-based Nurses' Health Study I and II and the Health Professionals Follow-up Study. The researchers analyzed responses to questionnaires about diet, lifestyle, and health conditions which participants completed every four years. They documented 5,500 cases of type 2 diabetes during 22 years of follow-up in NHS 1 participants, 2,359 cases over 14 years in NHS II participants, and 2,648 cases over 20 years in HPFS participants.

Sun and his colleagues found that the biggest consumers of white rice were less likely to have European ancestry or to smoke and more likely to have a family history of diabetes. Eating brown rice was not associated with ethnicity but with a more health-conscious diet and lifestyle. In the analysis, researchers adjusted for a variety of factors that could influence the results, including age, body mass index, smoking status, alcohol intake, family history of diabetes, and other dietary habits, and found that the trend of increased risk associated with high white rice consumption remained. Because ethnicity was associated with both white rice consumption and diabetes risk, the researchers conducted a secondary analysis of white participants only and found similar results.

Because brown rice consumption was low in the study population, the researchers could not determine whether brown rice intake at much higher levels was associated with a further reduction in diabetes risk. Substitution of other whole grains for white rice was more strongly associated with lowering diabetes risk. This observation, said the researchers, may result from more reliable estimates based on participants' higher consumption of whole grains other than brown rice.

The current Dietary Guidelines for Americans, released by the U.S. government, identifies grains, including rice, as one of the primary sources of carbohydrates and recommends that at least half come from whole grains. Americans are eating more rice — but it's mostly white. "From a public health point of view, whole grains, rather than refined carbohydrates, such as white rice, should be recommended as the primary source of carbohydrates for the U.S. population," said Hu, "These findings could have even greater implications for Asian and other populations in which rice is a staple food."

More information: "White Rice, Brown Rice, and Risk of Type 2 Diabetes in US Men and Women," Qi Sun, Donna Spiegelman, Rob M. van Dam, Michelle D. Holmes, Vasanti S. Malik, Walter C. Willett, Frank B. Hu, Archives of Internal Medicine, online June 14, 2010. (Arch Intern Med. 2010;170[11]:961-969.)

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