Choline-poor diet in older women linked to worse damage from fatty liver disease

February 17 2012

(Medical Xpress) -- Menopausal women with non-alcoholic fatty liver disease (NAFLD) who don't consume enough of the essential nutrient choline appear to be at higher risk for liver scarring, according to research led by scientists at Johns Hopkins Children's Center.

The findings of a multicenter study, which compared liver damage and choline consumption among 664 children and adults with NAFLD, were published online Feb. 15 in *The American Journal of Clinical Nutrition*.

Choline-rich foods include dairy, eggs, cod, broccoli, peanut butter, lean beef, chicken breast, chicken liver, seed oils, leafy greens, cauliflower and legumes, such as peas, beans and lentils. Low choline intake was not linked to worse damage in children, women of childbearing age and men with NAFLD, a finding that underscores the existence of important age and gender differences in disease progression, the research team reports.

The scientists caution that the exact mechanism behind low choline and liver damage remains unclear and emphasize that adding choline to one's diet may not halt disease progression.

Researchers speculate that one possible explanation behind the worse scarring seen among post-menopausal women is that estrogen may affect a subset of genes that regulate choline synthesis, and that declining levels of estrogen after menopause may interfere with this process.

Complicating the picture, they note, is that NAFLD has many causes and

develops differently from patient to patient. However, the researchers say, the new findings do point to choline as one possible catalyst that may hasten liver damage in certain patients. Because choline needs vary by age and gender, the Institute of Medicine recommends 425 mg daily choline consumption for non-pregnant, non-breastfeeding women and 550 mg daily for men. Teens should consume 400 mg daily and pre-teens 375 mg daily. Children between ages 4 and 8 should get 250 mg per day, and children between ages1 and 3 should consume 200 mg daily. Infants less than 1 year of age should receive between 125 and 150 mg daily via formula or breast milk.

“Physicians have long been fascinated by the unpredictable nature of fatty liver disease and the reasons some patients progress quickly to advanced stages of liver scarring while others have little to no inflammation for many years,” says lead investigator Anthony Guerrerio, M.D., Ph.D., a pediatric gastroenterologist at the Johns Hopkins Children’s Center.

“Our research illuminates one potential mechanism of liver scarring that portends worse outcomes in some but not all patients,” he adds.

NAFLD affects one in three Americans, researchers estimate, and is marked by fatty build-up in the liver, with or without inflammation. In its advanced form, known as non-alcoholic steatohepatitis, the disease causes cell death, irreversible scarring and liver failure. Physicians do not know why some patients develop the more severe forms of the disease fairly quickly while others remain relatively healthy, but nutrition, body weight, genes and environment are all believed to play a role in disease progression. Recent research shows that more children and adults are developing fatty livers, likely due to growing obesity rates, the investigators say.

In the current study, the researchers analyzed liver biopsy results and

choline consumption, obtained from patient food diaries. None of the patients met the daily recommended intake, but only those eating less than half the recommended doses were deemed choline-deficient. Controlling for other risk factors, like body weight and alcohol consumption, menopausal women who consumed less than half the recommended daily choline had greater degrees of liver scarring, the researchers found. Advanced liver scarring was found in nearly half of the 63 postmenopausal women in the group with choline-deficient diets, compared with 30 percent of the 131 post-menopausal women with non-deficient diets. Differences were far less pronounced among men, children and women of child-bearing age. Advanced liver scarring was found in 18 percent of choline-deficient women of childbearing age and in 10 percent of those with non-deficient diets. Eighteen percent of choline-deficient males 14 years of age and older had advanced liver scarring compared with 16 percent among their non-deficient counterparts. Advanced liver fibrosis was seen in 10 percent of choline deficient children ages 9 through 13, while 17 percent of non-deficient ones had the same degree of liver scarring.

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