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Associations between choline intake, body composition, lipid profile, and liver status in healthy adults

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Abstract

Choline is an essential nutrient involved in several processes, including the export of lipids from the liver. Recent studies have underlined that low choline intake may be linked to greater body weight and liver dysfunction. The aim of this study was thus to determine whether choline intake is associated with body weight, body mass index (BMI), body composition, lipid profile, or liver steatosis indices.

407 healthy subjects aged 20–40 were enrolled in Poznań, Poland from 2016 to 2018. Food intake was assessed using three-day food records. Choline intake was analyzed using the USDA Database for the Choline Content of Common Foods, which summarizes the levels of choline found in a range of food items. Weight to 0.1 kg and height to 0.01 m were measured using an electronic scale and a stadiometer, respectively. BMI was calculated as body weight in kilograms divided by height in meters squared. Fat mass and lean body mass were determined using whole-body air-displacement plethysmography. Waist and hip circumferences were measured to 0.5 cm using nonelastic tape. Total cholesterol, LDL cholesterol, HDL cholesterol, and triglyceride levels in serum were determined using a biochemical analyzer. The following biomarkers of liver steatosis were calculated: NAFLD liver fat score (NAFLD-LFS), fatty liver index (FLI), and hepatic steatosis index (HSI). To analyze associations between choline intake and these parameters, we used multiple regression with adjustments for age, sex, and energy intake.

The mean BMI was 25.9 ± 5.28 kg/m², the mean body weight was 78.39 ± 18.03 kg, the mean body fat percentage was $29.1 \pm 10.79\%$, and the mean choline intake was 447.93 ± 235 mg/day. Choline intake was negatively associated with body weight, body fat percentage, waist circumference, and FLI index ($p < 0.05$ for all associations) and positively associated with HDL cholesterol ($p < 0.05$). There were no associations between choline intake and BMI, hip circumference, total cholesterol, LDL cholesterol, and the following fatty liver indexes: HSI and NAFLD-LFS.

Our study suggests that higher choline intake is associated with favorable body composition and may have a protective role on liver status. However, additional studies are needed to understand the effect of choline on these parameters.

The authors declare that they have no conflict of interests.

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Conflict of Interest

There is no conflict of interest