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Differences in dietary intakes and overall diet quality by risk for non-alcoholic fatty liver disease in US adults

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Non-alcoholic fatty liver disease (NAFLD) is a progressive fibroinflammatory disease characterized by obesity and metabolic abnormalities (impaired lipid metabolism and insulin resistance)(1). There is a paucity of data around the nutritional gaps and dietary patterns that differ across the presence and absence of NAFLD and how these intakes are related to the development and treatment of NAFLD.

Data from 29,271 US adults (20+ years) from 2007–2018 National Health and Nutrition Examination Survey (NHANES) were stratified by NAFLD risk using the Fatty Liver Index (FLI) from BMI, waist circumference, serum triglycerides, and gamma-glutamyl-transferase (GGT) (2). Fatty Liver Index scores were categorized as FLI < 30 "rule out" and FLI ≥ 60 "rule in" for hepatic steatosis. Dietary intakes were assessed using an automated multiple-pass 24-hour recall in the Mobile Examination Centre for foods and beverages consumed during the previous day. Energy, nutrients and MyPlate equivalents intakes were estimated using the FNDDS (3) and the FPED (4) databases, respectively. Overall diet quality was computed through the Healthy Eating Index 2015 (HEI-2015, range: 0–100) to identify concordance with the 2015–2020 Dietary Guidelines for Americans. A higher score indicated a better diet quality. Mean (±SE) differences in energy, nutrients, MyPlate equivalents and diet quality were compared by ANCOVA across FLI categories (<30, 30–60, ≥60), controlled for age, gender, and race/ethnicity. Data were weighted to create a nationally representative sample using SPSS Complex Sample to account for sampling design and create appropriate standard errors for inferential statistics.

Mean HEI-2015 scores were significantly different (P < 0.001) across all levels of FLI scores, as diet quality was poorer for adults in the FLI ≥ 60 category at 49.2 ± 0.2 compared to those with an FLI < 30 at 53.7 ± 0.3. There were no significant differences in mean intake of total energy (kcal), protein, or carbohydrate across FLI categories. Mean intakes of select nutrients were significant across all FLI levels, with the highest saturated fat intakes in those with scores of FLI ≥ 60 (27.3 ± 0.2, P < 0.001). Adults with an FLI score <30 had significantly higher intakes of vitamins A, D, E, and K (P < 0.003), with mean intakes of vitamins A, D, E, and K were higher for persons with FLI < 30 compared to FLI ≥60 [666 ± 12 vs 593 ± 9; 4.9 ± 0.1 vs 4.5 ± 0.1, 8.9 ± 0.1 vs 8.0 ± 0.1; and 135 ± 6.1 vs 102 ± 2.3, respectively]. Mean differences in micronutrient intakes for zinc, iron, and copper intakes were not significantly different across FLI categories but mean copper intakes (1.3 ± 0.01) were significantly lower than those with FLI ≥60 (P < 0.001).

Current NAFLD therapeutic regimens have focused on obesity-based medical nutrition therapies, which may overlook the nutritional gaps that contribute to health, nutritional status, and disease severity in NAFLD. More work is needed to address the role of dietary patterns and nutrient intakes for the prevention and treatment of NAFLD.

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