

Poor Mediterranean diet adherence in treated Celiac Disease patients with fatty liver disease highlights the need for a personalized nutritional assessment to prevent and treat associated metabolic conditions.

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Background: The gluten-free diet (GFD) is currently the only treatment available for the management of celiac disease (CeD). Ultra processed gluten-free products are often low in fibre and high in added sugar and fat. A Mediterranean diet has been proposed to treat fatty liver, which affects nearly 28% of treated CeD patients. **Methods:** We included consecutive biopsy-proven CeD patients with associated fatty liver diagnosed by abdominal ultrasound or CT scan, attending the adult McMaster Nutrition Assessment Clinic between Nov 2023 and Jan 2025. Demographics, anthropometrics, activity factor (short International Physical Activity Questionnaire), indirect calorimetry (Q-NRG), dietary intake (≥ 2 ASA24 food records) were collected. A Mediterranean Diet Score (14-point Mediterranean Diet Score Screener, excluding alcohol target) was calculated for each completed food record and scored as good (score ≥ 9 /13) or poor (score < 9 /13) diet adherence.

Results: A total of 138 CeD patients were seen in the Nutrition Assessment Clinic. Of these, 36% had fatty liver disease and 19 patients of these had completed at least 2 food records [female 58%; median age (IQR) 47yr (25); median yr of diagnosis (IQR) 5yr (3.5); active CeD in 26%; BMI ≥ 30 in 74%]. Analysis of a total of 53 food records showed **none of the patients** had good adherence to the Mediterranean Diet (mean Medi Score 5.0 ± 1.7). Extra virgin olive oil (4 tablespoons/day) and fruit (3 serves/day) criteria were most often not met (0/53 records, 7/53 records resp.). Average intake of protein was $77 \text{g} \pm 26$ /day (1.0 ± 0.3 g/kg/day) with **50% of patients not meeting the recommended intake of ≥ 1.0 g/kg/day**. Average intake of fiber was $15 \text{g} \pm 6.2$ /day with **85% not meeting the recommended intake**. Nutritional assessment identified overweight (BMI=25-29.9) in 25% and obesity (BMI ≥ 30) in 75% of CeD patients with fatty liver. All patients had a waist circumference > 88 cm. Resting Energy Expenditure adjusted for weight was higher in the obese compared with overweight CeD though not significant (18.5 ± 4.9 vs 17.2 ± 2.0 kcal/kg/day; $p=0.6$). There was no difference in physical activity factor between CeD with overweight and with obesity (1.3 ± 0.1 vs 1.3 ± 0.1 ; $p>0.05$).

Conclusions: Treated celiac disease patients with fatty liver on a GFD exhibit poor diet quality, characterized by low protein and fiber intake and an overall lack of adherence to a Mediterranean dietary pattern. Personalized nutrition assessment and follow up by a registered dietitian is crucial to improve long-term health in CeD.