

Age-Specific Associations Between Mediterranean Diet Quality, Gut Microbiota, and Body Composition in Alzheimer's Disease

Paola Gualtieri

Section of Clinical Nutrition and Nutrigenomic, Department of Biomedicine and Prevention, University of Rome Tor Vergata, Via Montpellier 1, 00133 Rome, Italy

Giulia Frank

Section of Clinical Nutrition and Nutrigenomic, Department of Biomedicine and Prevention, University of Rome Tor Vergata, Via Montpellier 1, 00133 Rome, Italy

Laura Di Renzo

Section of Clinical Nutrition and Nutrigenomic, Department of Biomedicine and Prevention, University of Rome Tor Vergata, Via Montpellier 1, 00133 Rome, Italy

Abstract

Purpose/Objectives: To assess whether the impact of Mediterranean diet quality on gut microbiota and body composition differs by age in Alzheimer's disease (AD).

Materials/Methods: We analyzed 73 AD patients stratified into <77 and ≥77 years. Mediterranean diet adherence was assessed by the 14-item MEDAS questionnaire (0–14 points). Anthropometry and bioimpedance (BMI, FM%, BCMI, PhA) were measured, and microbiota was profiled by 16S rRNA sequencing. Spearman correlations tested associations between MEDAS (total score and items) and gut–body outcomes in each age stratum.

Results: In patients <77 years, higher MEDAS total correlated with both BMI ($\rho=+0.53$, $p=0.02$) and BCMI ($\rho=+0.69$, $p=0.01$). Among single items, greater motricity correlated with higher phase angle ($\rho=+0.39$, $p=0.03$) and *Firmicutes* abundance ($\rho=+0.40$, $p=0.04$), while acute illness/psychological stress correlated with *Bacteroidetes* ($\rho=+0.40$, $p=0.04$). Polypharmacy (>3 drugs/day) correlated with *Firmicutes* ($\rho=+0.43$, $p=0.03$). Conversely, in patients ≥77 years, no significant associations were detected between MEDAS and either microbial or nutritional parameters.

Conclusions: These findings indicate that in AD, the relationship between diet quality and the gut–body axis is evident in younger patients, whereas it is attenuated or lost in older patients. This suggests that dietary quality may exert its most measurable influence on microbiota and nutritional status before advanced age and disease progression.