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Prospective association of the Mediterranean diet with risk of cardiometabolic multimorbidity in a UK-based cohort: the EPIC-Norfolk study

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With the worldwide population ageing and decreased mortality from major chronic diseases, it has become increasingly common for adults to have several co-occurring diseases, known as multimorbidity⁽¹⁾. One of the most common multimorbidity patterns is cardiometabolic multimorbidity (CMM), which is defined as the coexistence of two or more cardiometabolic diseases (CMDs), including coronary heart disease, stroke, and type 2 diabetes (T2D)⁽²⁾. CMM has been shown to increase the risk of death substantially compared to each single cardiometabolic condition⁽²⁾. The Mediterranean diet is one of the most well-examined healthy dietary patterns. While prior studies have found inverse associations between adherence to the Mediterranean diet and risk of single CMD, the prospective association of the Mediterranean diet with risk of CMM, particularly with disease transitions of CMM, from CMD-free to first CMD and to CMM, remains unclear. The aim of this study was to investigate the prospective association of baseline adherence to the Mediterranean diet, defined by two Mediterranean diet scores (MDSs), with risk of CMM, and further to explore how baseline Mediterranean diet adherence may impact the disease transition risks of CMM, from free of CMD at baseline to first CMD, and subsequently to CMM.

We used data from the UK-based EPIC-Norfolk cohort study of 21,900 adults, aged 40–79 free of prevalent myocardial infarction (MI), stroke, and T2D at baseline (1993–1997). Based on the food-frequency questionnaire collected at baseline, a median-based MDS and a pyramid-based MDS were derived to measure participants' baseline adherence to the Mediterranean diet⁽³⁾. Cox regression and multi-state model were conducted to investigate the associations.

During a median follow-up of 21.4 years, we observed 5528 CMD events and 739 CMM events. Cox regression analyses showed a significant inverse association between baseline adherence to the Mediterranean diet and CMM risk. The hazard ratio (HR) (95% CI) of CMM for one standard deviation increase in the median-based MDS was 0.89 (0.83, 0.96) after adjusting for sociodemographic and lifestyle covariates. Multi-state model indicated that adhering to the Mediterranean diet at baseline was significantly associated with lower risks of transition from baseline to first stroke and T2D, with HRs being 0.95 (0.91, 0.99) and 0.90 (0.86, 0.95) respectively, per one standard deviation increase in the median-based MDS. However, the estimated associations were not significant in transitions from baseline to first MI or from any first CMD to CMM. The pyramid-based MDS showed similar findings and estimates.

Findings of our study emphasize the importance of adhering to the Mediterranean diet to potentially prevent the development of CMM. The results suggest that baseline Mediterranean diet may play a more crucial role in preventing first stroke or T2D compared to preventing the development of CMM from first CMD in the disease transition process of CMM.

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