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Different impact of dietary fatty acid on all-cause mortality according to the kidney function based on the nation-wide population study

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Objectives: Although the relationship between fatty acids and the risk of mortality has been long-lasting discussed, there is little evidence to support that the effect of fatty acids. This study aims to investigate the association between dietary fatty acids and all-cause mortality.

Methods: We used data from the 92,062 participants of US National Health and Nutrition Examination Survey 1999-2015. The intake of fatty acids was adjusted with the total energy intake and divided by the quartile, the first quartile group was regarded as the reference. We used a multivariate Cox-proportional hazard model to identify the impact of fatty acids on all-cause mortality.

Results: Among 36,747 subjects, there were 922 (4.4%) and 3,544 (22.4%) death cases in eGFR ≥90 and <90 mL/min/1.73m^2 groups, respectively. Among saturated fatty acids (SFA), greater intake of hexadecanoic acid (adjusted hazard ratio [aHR] 1.13 in 4th quartile [Q4]) and octadecanoic acid (aHR 1.13 in Q4) showed the increased risk for all-cause mortality. In addition, most polyunsaturated fatty acids (PUFA) except eicosatetraenoic acid showed a beneficial effect on all-cause mortality. Among subjects with eGFR ≥90, the harmful effect of SFA was attenuated and the beneficial effect of PUFA remained in only octadecatrienoic acid. On the contrary, for the subjects with eGFR <90, the harmful effect of hexadecanoic acid (aHR 1.17 in Q4) and octadecanoic acid (aHR 1.16 in Q4) was exacerbated. The beneficial effect of PUFA was also prominent in this group; octadecatrienoic acid (aHR 0.86 in Q4), eicosapentaenoic acid (aHR 0.86 in Q4), docosapentaenoic acid (aHR 0.88 in Q4), and docosahexaenoic acid (aHR 0.88 in Q4).

Conclusions: The impact of dietary fatty acids on all-cause mortality was different in according to the kidney function. More specified and targeted counseling for restricting SFA and encouraging PUFA needs to be considered especially for subjects with lower eGFR.