

# Dietary Omega-3 Fatty Acid, Ratio of Omega-6 to Omega-3 Intake and Survival in Long-Term Hemodialysis Patients

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## INTRODUCTION

- Human beings evolved on a diet with an equal proportion of omega-6 to omega-3 poly-unsaturated fatty acid (PUFA). In Western diets this ratio has dramatically increased up to 15 times higher.
- Given the evidence relating progressive chronic kidney disease (CKD) to chronic inflammation, and that half of all CKD deaths are attributed to cardiovascular disease, the anti-inflammatory and cardioprotective benefits of omega 3 PUFAs may play an important role in modulating these processes to reduce mortality.
- We hypothesized that the anti-inflammatory and cardio-protective benefits of dietary omega 3, compared to omega 6, polyunsaturated fatty acids (PUFAs), may modulate the inflammatory processes.
- This dietary effect of Omega-6 fatty acids may reduce death risk in maintenance hemodialysis (MHD) patients.

## METHODS & RESULTS

- Using 3-day diet record, we examine the survival predictability of dietary omega-3 PUFA and the ratio of omega-6 to omega-3 PUFA at the start of the cohort of 145 hemodialysis patients who were followed for up to 6 years (2001-07). Cox proportional models were used to estimate death hazard ratios (HR) [and 95% confidence intervals (95%CI)] after adjustment for case-mix.
- There was no correlation between omega-3 PUFA intake and mortality. However, the lowest (vs. highest) quartile of dietary omega-6 to omega-3 ratio was associated with decreased mortality hazard ratio (95% CI) in the analyses adjusted for age and gender [0.54 (0.21-1.38), p trend=0.14], case-mix plus diet [0.37 (0.14-1.08), p trend=0.04] and case-mix plus diet plus BMI plus history of hypertension (HTN) [0.39 (0.14-1.18), p trend=0.06].
- Spline survival models confirmed the associations (Figure 1).

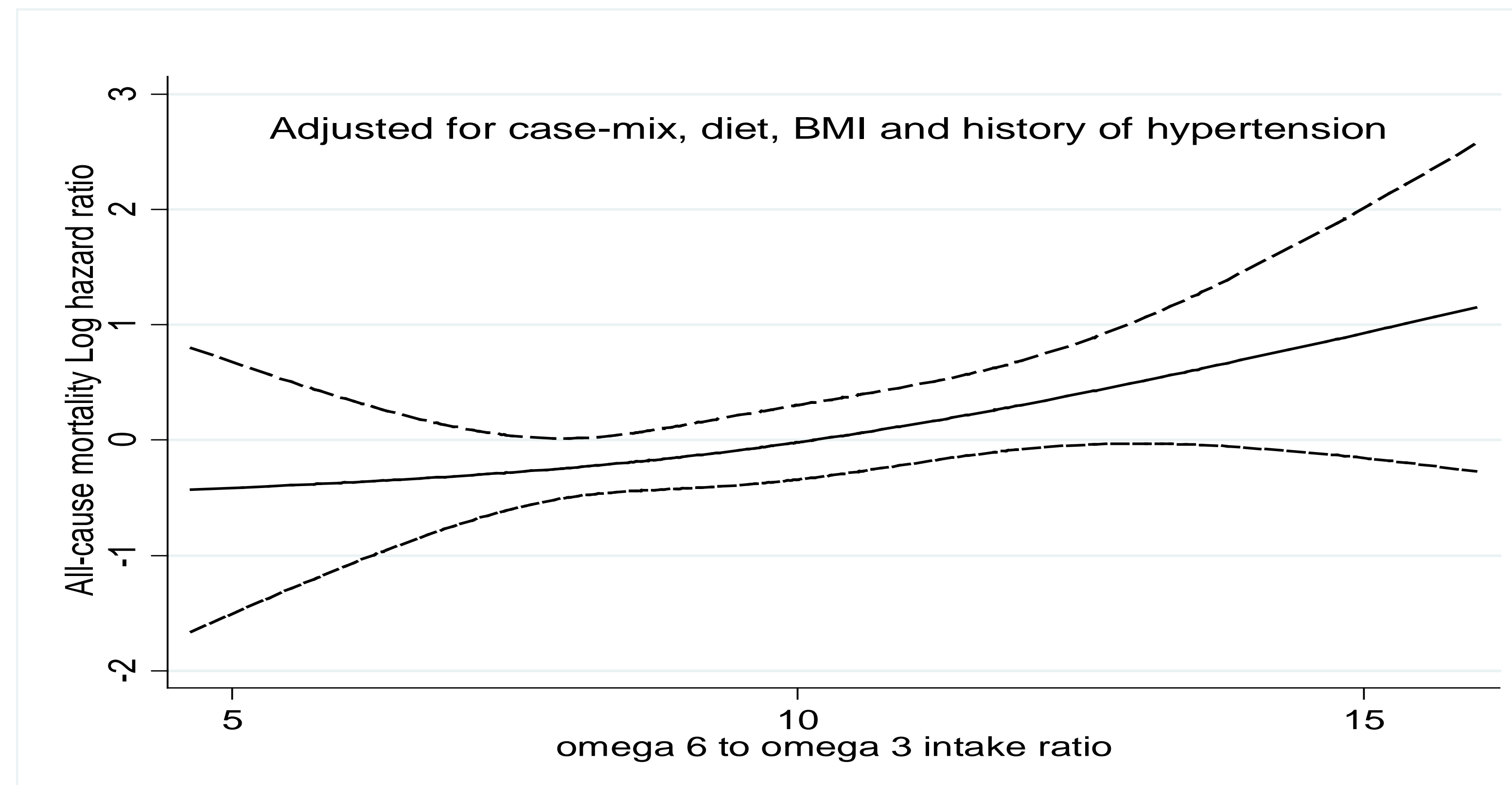


Figure 1. Cubic spline models of the Cox proportional regression analyses reflecting adjusted mortality-predictability (with 95% CI) according to omega 6 to omega 3 PUFA intake ratio

## CONCLUSIONS

- Higher omega-6 to omega-3 PUFA intake ratios are associated with increased death risk in hemodialysis patients.
- This association exists even after adjustments for energy, saturated fatty acids, trans fat, cholesterol and fiber intakes.

## KEY LEARNINGS

- ✓ These findings, if verified in additional, prospective studies, suggest that the low dietary ratios of omega 6 to omega 3 PUFA should be recommended to MHD patients.
- ✓ Future studies should also examine the association of different kinds of omega 3 PUFAs; i.e., EPA and DHA (intakes with inflammatory status and mortality in MHD patients).

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