Non-esterified Fatty Acids and Cardiovascular Mortality in Elderly Men with Chronic Kidney Disease

Hong Xu, MD,[1]* Zibo Xiong, MD,[1,]* Xiaoyan Huang, MD, PhD,[1] Johan Ärnlöv, MD, PhD,[2] Abdul Rashid Qureshi, MD, PhD[1], Tommy Cederholm, MD, PhD [2], Per Sjögren, [2] Bengt Lindholm, MD, PhD,[1] Ulf Risérus, PhD, [2] Juan Jesús Carrero, PhD[1]
*These authors contributed equally

[1]Renal Medicine and Baxter Novum, Karolinska Institutet, Stockholm, Sweden; [2]Dept of Public Health and Caring Sciences, Clinical Nutrition and Metabolism, Uppsala University, Uppsala, Sweden;

OBJECTIVES

Whereas non-esterified fatty acids (NEFA) are essential as energy substrate for the myocardium, an excess of circulating NEFA can be harmful. We here aim to assess plausible relationships between serum NEFA and mortality due to cardiovascular disease (CVD) in individuals with chronic kidney disease (CKD).

METHODS

Prospective cohort study from the third examination cycle of the Uppsala Longitudinal Study of Adult Men, a population-based survey of 1221 elderly men aged 70–71 years residing in Uppsala, Sweden. Data collection took place during 1991-95. All participants had measures of kidney function and we here investigated 623 (51.7%) of them with manifest CKD (defined as either estimated glomerular filtration rate <60 mL/min/1.73m^2 or urine albumin excretion rate ≥20 µg/min). Follow-up for mortality was done from examination date until death or December 31st, 2007. After a median (inter-quartile range) follow-up of 14 (8-16.8) years, associations of NEFA with mortality (all-cause, CVD-, ischemic heart disease [IHD]-, acute myocardial infarction [AMI]- related) were ascertained.

RESULTS

The median of serum NEFA was 14.1 (11.3-17.8) mg/dL. No association was found with measures of kidney function. Diabetes and serum triglycerides were the only multivariate correlates of NEFA. During follow-up, 453 participants died, of which 209 deaths were due to CVD, including 88 IHD deaths, with 41 attributed to AMI. **Fig. 1** shows Kaplan-Meier curves of survival vs NEFA tertiles. In a model fully adjusted for covariates, serum NEFA was an independent risk factor for all-cause mortality [HR per Log_2 increase (95% confidence interval, CI) 1.22 (1.00-1.48)], and for CVD-related death [1.51 (1.15-1.99)], including both IHD [1.51 (1.00-2.32)] and AMI mortality [2.08 (1.09-3.98)]. **Fig. 2** shows spline curve of HR for CVD-related mortality associated with serum NEFA concentration.

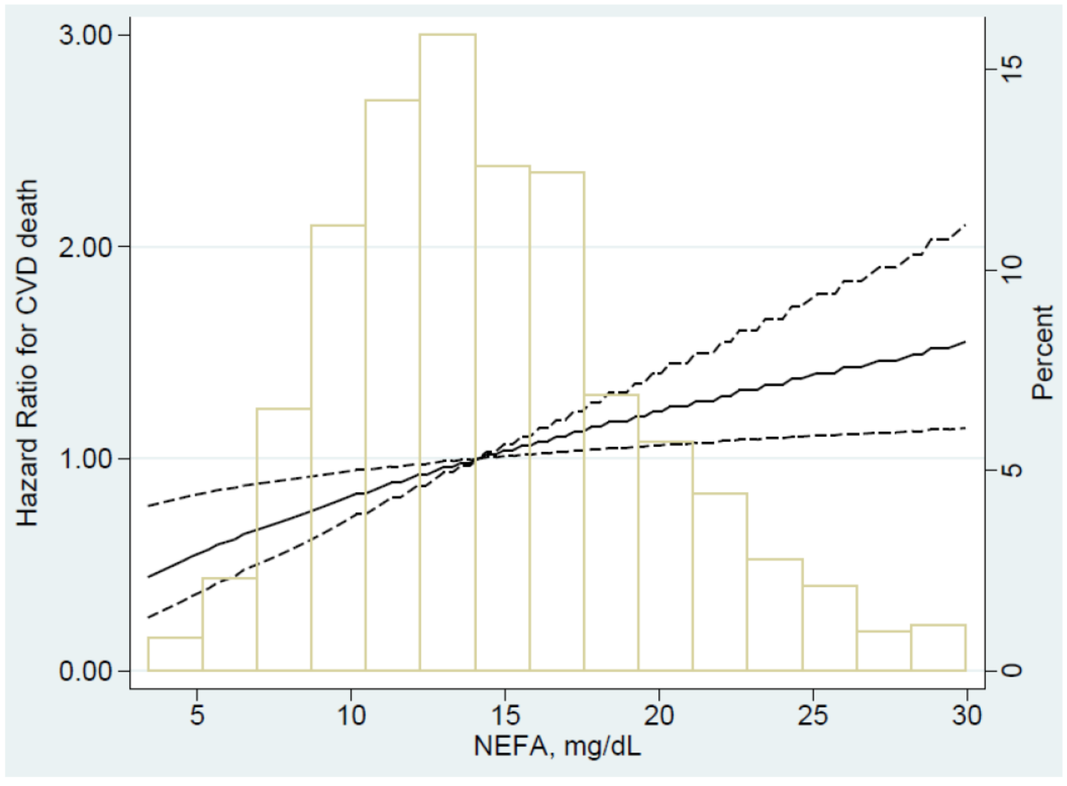

Figure 2: Restricted cubic spline curve showing adjusted hazard ratios (bold line) and 95% confidence intervals (dashed lines) for cardiovascular-related mortality associated with serum NEFA concentration. Covariates include age, BMI, smoking status, physical activity, cardiovascular

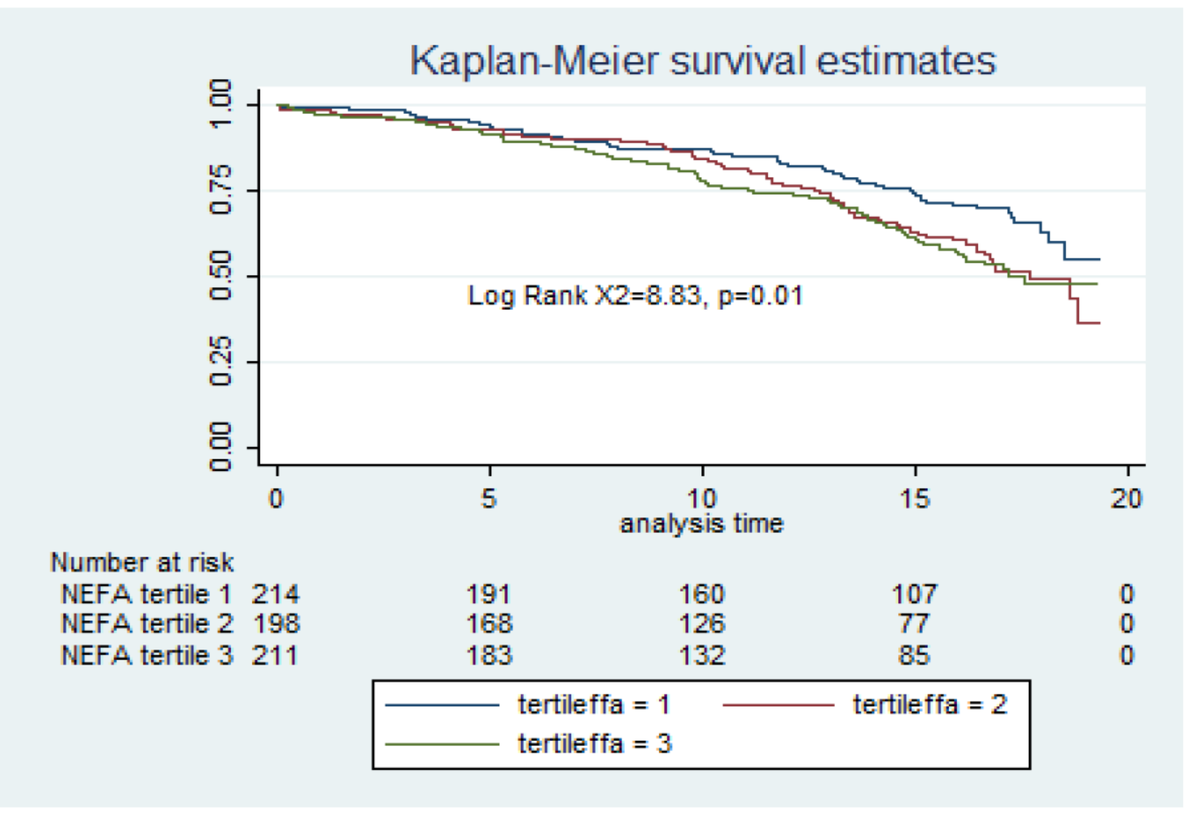

Figure 1: Kaplan–Meier curves and individuals at risk of cardiovascular mortality according to tertiles of serum NEFA distribution.

CONCLUSIONS

Elevated serum NEFA associated with CVD-mortality, and particularly with mortality due to AMI, in a homogeneous population of older men with moderate CKD.

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