

OUTCOMES ASSOCIATED TO SERUM PHOSPHATE LEVELS IN PATIENTS WITH SUSPECTED ACUTE CORONARY SYNDROME

Hong Xu, MD, Marie Evans, MD, PhD, Alessandro Gasparini, MS, Karolina Szummer, MD, PhD, Jonas Spaak, MD, PhD, Jonas Ärnlöv, MD, PhD, Bengt Lindholm, MD, PhD, Tomas Jernberg, MD, PhD, Juan Jesús Carrero, Pharm, PhD

1 Karolinska Institutet, Stockholm, Sweden; 2 Uppsala University, Uppsala, Sweden

OBJECTIVES

We investigated the association between phosphate and the risk of adverse clinical outcomes in patients with manifest cardiovascular disease (CVD).

RESULTS

Included were 2,547 patients (68% men, mean age 67 ± 14 years) with median phosphate of 1.10 (range 0.14-4.20) mmol/L. During hospitalization, 198 patients died and 328 suffered an adverse event. Within one year post-discharge, further 381 deaths and 632 CVD events occurred. The associations of phosphate with mortality and CVD were J-shaped, with highest risk magnitudes at higher phosphate levels. For instance, compared to patients in the 50th percentile of phosphate distribution, those above the 75th percentile (1.3 mmol/L, normal range) had significantly higher odds for in-hospital death [odds ratio 1.36, 95% confidence interval (CI) (1.08-1.71)] and of CVD post-discharge [sub-hazard ratios 1.17 (1.03-1.33)].

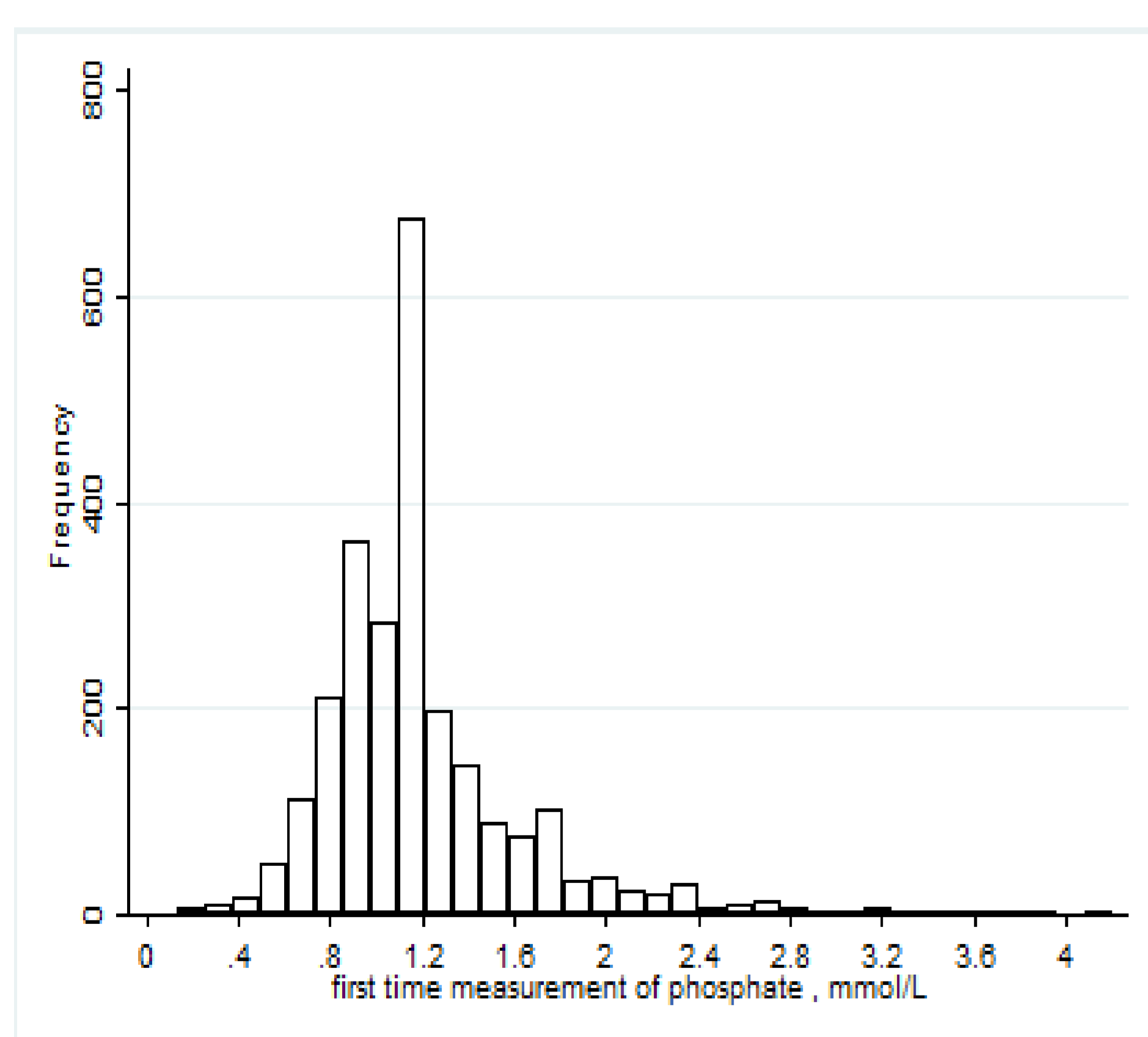


Figure 1: Distribution of serum phosphate levels at first time measurement (n=2547).

METHODS

Observational study of patients hospitalized during 2006-2011 in Stockholm, Sweden, because of suspected acute coronary syndrome (ACS). The exposure was serum phosphate during the hospitalization. We modeled the association between phosphate and in-hospital death or in-hospital events (composite of myocardial infarction, cardiogenic shock, resuscitated cardiac arrest, atrial fibrillation, or atrioventricular block) as well as the one-year post-discharge risk of death or cardiovascular event (composite of myocardial re-infarction, heart failure and stroke). Confounders included demographics, comorbidities, kidney function, diagnoses, in-hospital procedures and therapies.

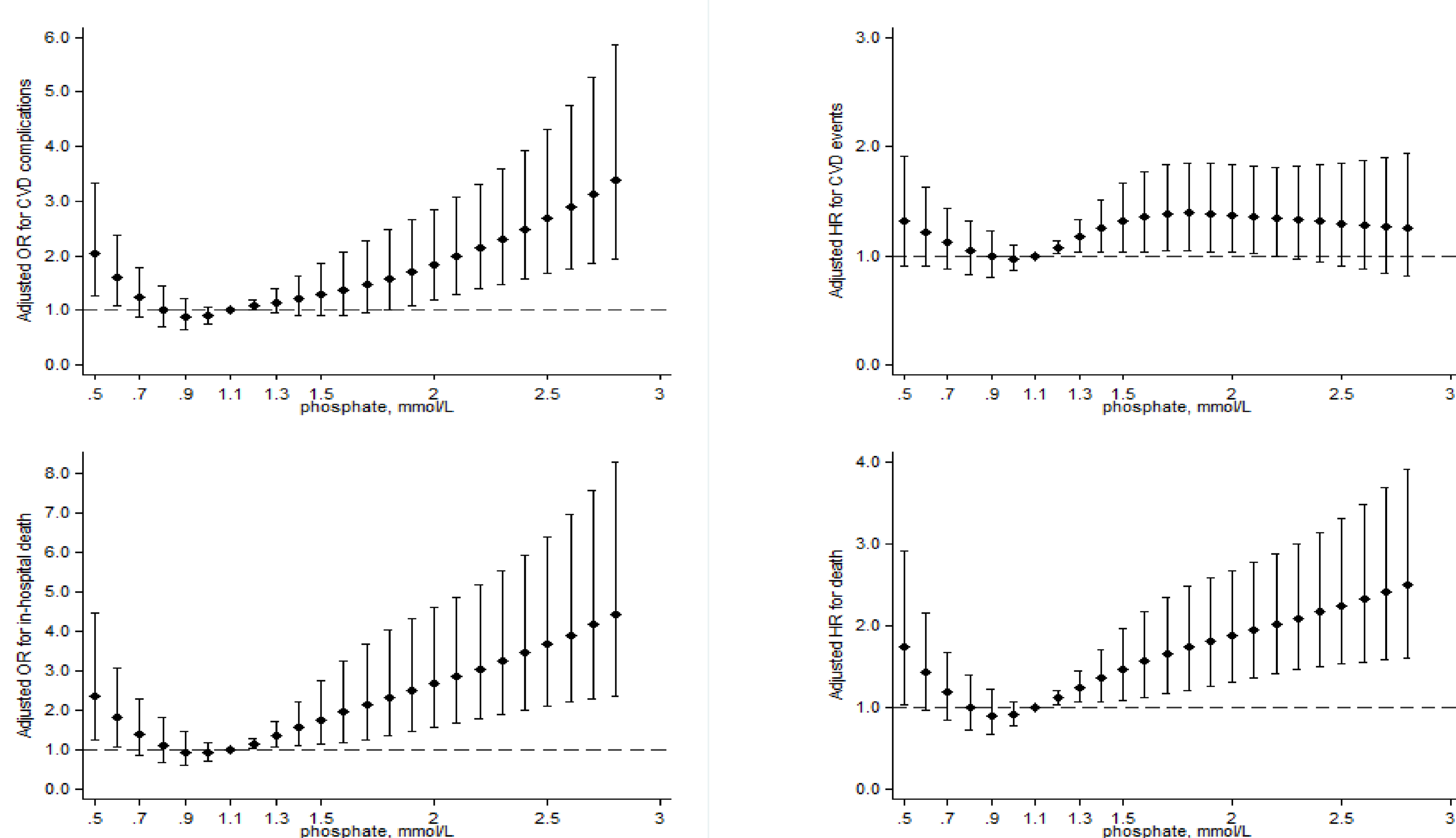


Figure 2: Restricted cubic spline curve showing Odds Ratios (OR) and Sub-hazard Ratios (SHR) and 95% confidence intervals (95% CI) for in hospital outcomes and 1-year post-discharge outcomes. Covariates age (continuous), sex, eGFR (continuous), hypertension, diabetes, prior myocardial infarction, history of heart failure, prior stroke, main diagnosis (ACS, heart failure, arrhythmia, others), type of myocardial infarction (ST-elevation), in-hospital procedures (coronary angiography, PCI, CABG), and medication (ACEI/ARB, DAPT, beta-blocker, and statins).

CONCLUSIONS

In patients with suspected ACS, both higher and lower phosphate levels associated with increased risk of adverse outcomes during the index hospitalization and within one year post-discharge. The risk association was present already within normal-range serum phosphate values.