

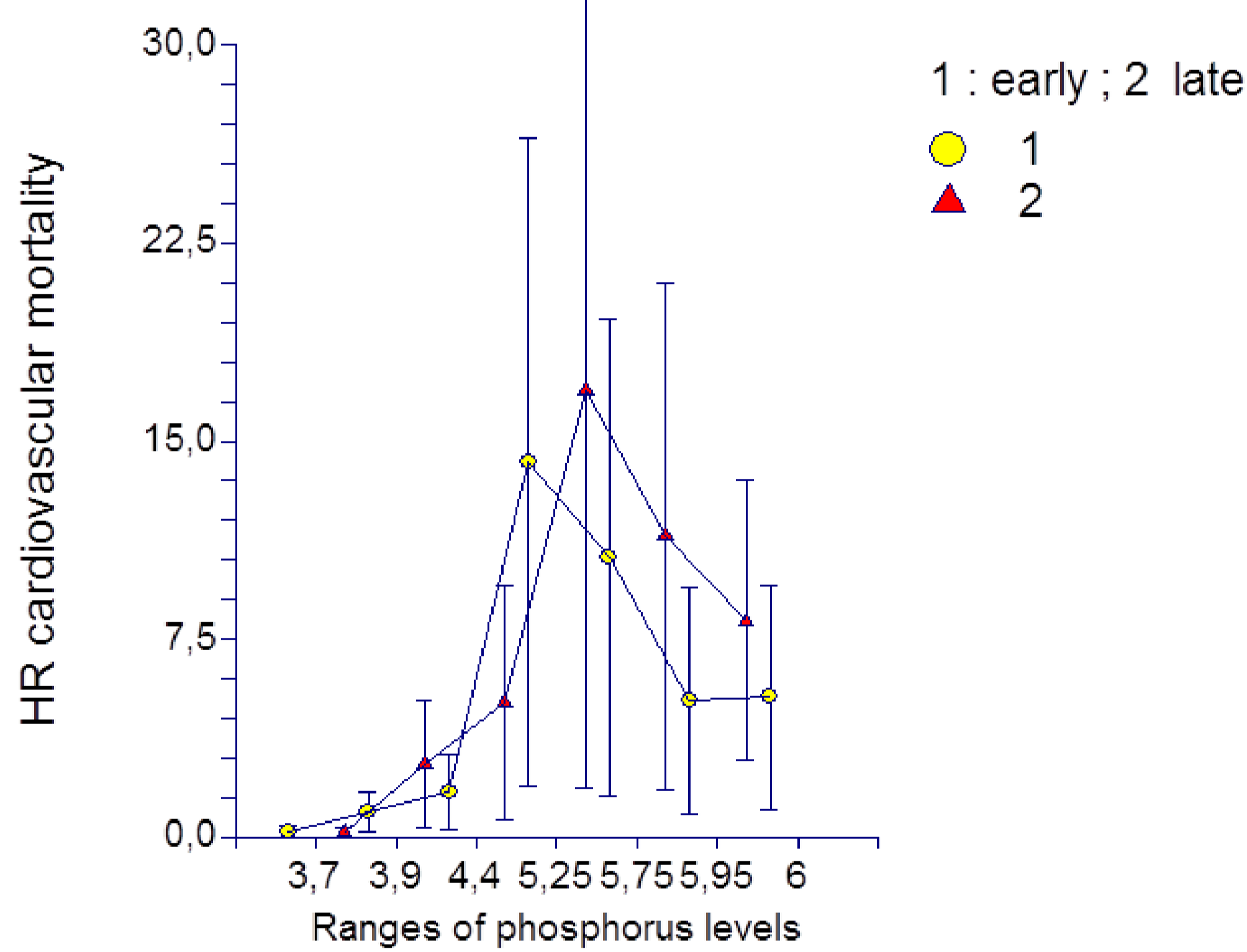
PHOSPHORUS AND MORTALITY RELATIONSHIP: ANALYSIS CONSIDERING VERY NARROW CUT-OFFS AND CONFOUNDER BEYOND TIME UP-DATING VARIABLES

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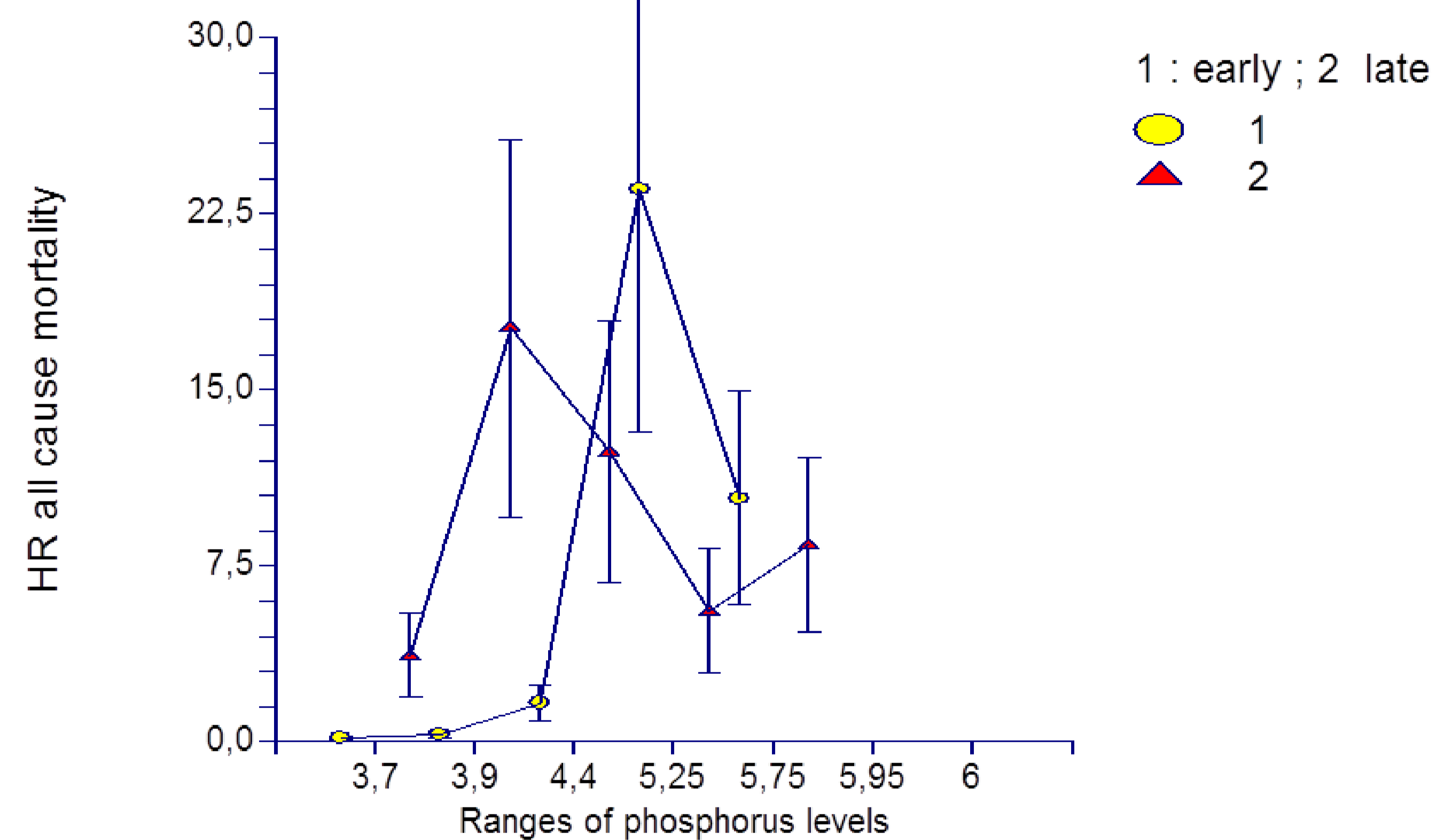
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Relationship between phosphorus and mortality is proved in healthy and CKD patients. A large cut-off of phosphorus (in the order of 1,0 mg/dl) is established to link mortality in large sample size studies in hemodialysis patients .Also in time-updating phosphorus analysis, there may be additional confounding factors related to linear variables (such as nutritional exposure variables) and the proportion of cardiovascular disease if considered either in late period or in early period of whole dialysis vintage in this setting of patients .Aim of our study is to assess the type and association 's strength of phosphorus with mortality either in early or late periods of follow-up in prevalent hemodialysis patients , consideringmore close range of phosphoremia(in the order of 0,5 mg/dl) .Out of sixtyeight hemodialysis patients , fortyone prevalent hemodialysis patients (> 6 months hemodialysis period) are followed up for five years (January 2008-december 2012). The sample is considered in two different periods : early and late twelve months (Early (n41)and Late (n37) groups)[in the late group minimum follow-up of twelve moths is required). Same univariate(T0 variables) and multivariate (case mix , dialysis elapsed time, Phosphorus and singular exposure variables [Calcium, PTH,FA,CaxP, albumin , creatinin,ferritina, Karnofsky score ,Hb and cardiovascular diseases]) analysis are performed to estimate proportional hazard ratios of outcomes (all cause and cardiovascular mortality) for seven cut-offs of phosphorus levels (mg/dl) (= $>3,7$;= $>3,9$;= $>4,4$;= $>5,25$;= $>5,75$; = $>5,95$; = >6).Interaction for albumin is performed in both groups.All exposure variables are time-varyng variables (any date is median of four months determinations). P 0,05 is considered significancyFortyone prevalent hemodialysis patients are followed-up for 34(SD 18,5) months . All patients are censored for events (17% CV mortality ; 34% all cause mortality).By univariate analysis , all cause mortality is related to Dialysis vintage(HR 0,97(0,96-0,99),to age HR 1,08(1,02-1,15), to Karnofsky score HR 0,95(0,91-0,98),to albumin HR 0,10(0,01-0,57) and cardiovascular mortality to Albumin HR 0,02(0,002-0,41), age HR 1,08(0,99-1,17),Karnofsky score HR 0,94(0,88-0,99) in EARLY Group. By univariate analysis , all cause mortality is related to Dialysis vintage HR 0,97(0,95-0,99), age HR 1,08(1,01-1,15), to Karnofsky score HR 0,95(0,91-0,99) and cardiovascular mortality to BMI HR 1,24(1,01-1,52) in LATE Group. Generally,in both groups Age , Karnofsky score and Allbumin have the better proprtionality of HRs(Shoenfeld scale residuals vs time plots).By multivariate analysis ,phosphorus =>3,7 mg/dl inversaly and independently correlated with cardiovascular mortality in Early and Late groups, with a rduction of risk of 11% and 36% respectively(considering upper limits of HR).This vantage is indipendent from absence of cardiovascular disease and is lost for phosphorus => 3,9 mg/dl. Same analysis for all cause mortality demontrated a reduction risk of 33% in early but no in late group.Interaction for albumin <3,9 gr/dl was significancy for cardiovascular mortality in both groups(P0,05).Same interaction for all cause mortality was significant in early (P0,05) but no in late group(P0,21).Our study demonstred the indirect relationship of cardiovascular mortality with phosphorus ,ranging 3,7-3,9 mg/dl (range more close than classic 1mg/dl),indipendently from nutritional parameter examained (albumin <3,9 gr/dl) . This relationship remains similar throughout whole dialysis vintage ,beyond time-updating variables .The same is not for all cause mortality .

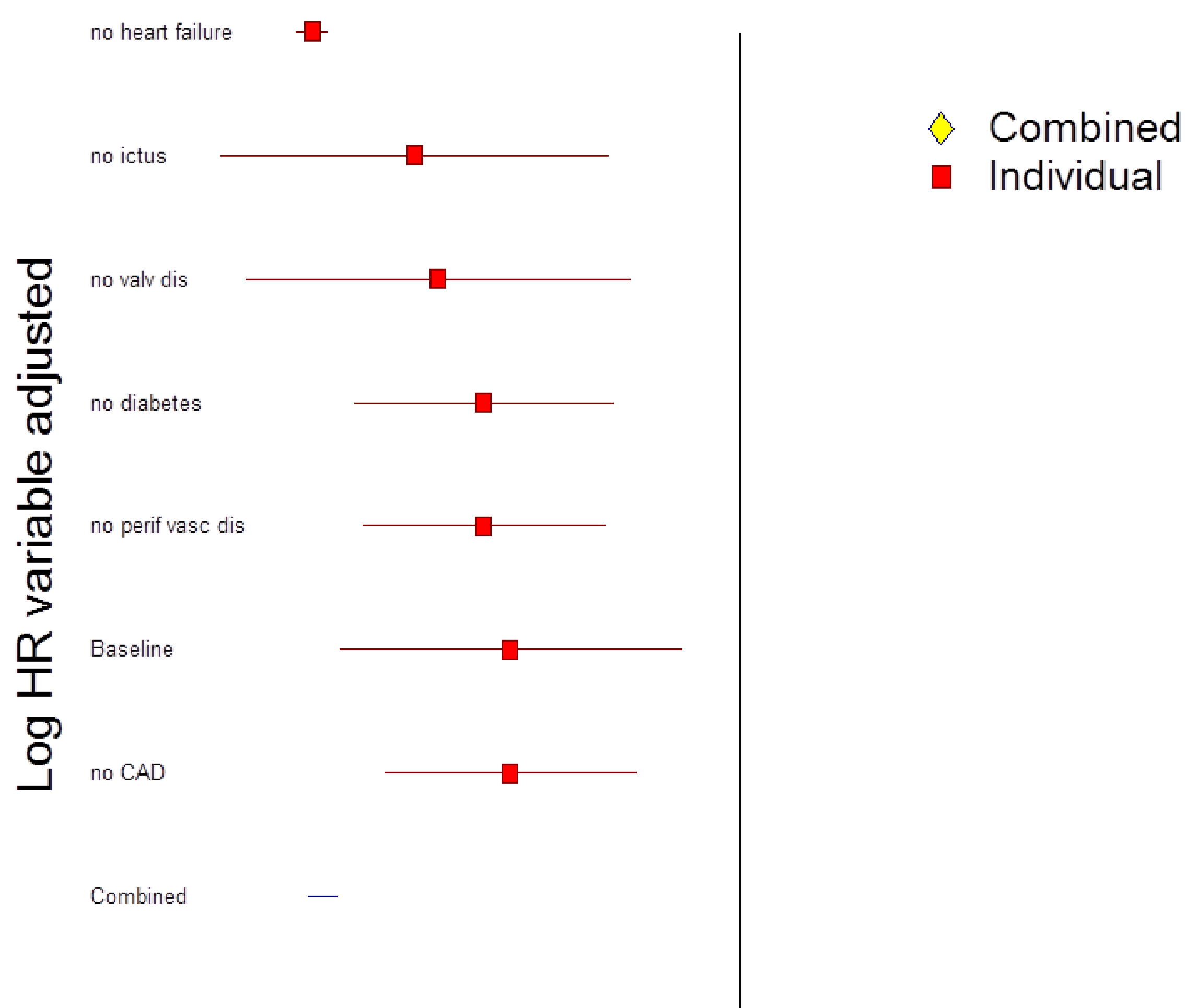
e-mix HR of cardiovascular mortality for phosphorus level set in early and late group



n,phosphorus andcase-mix HR of all cause mortality for phosphorus level set in early and late groups



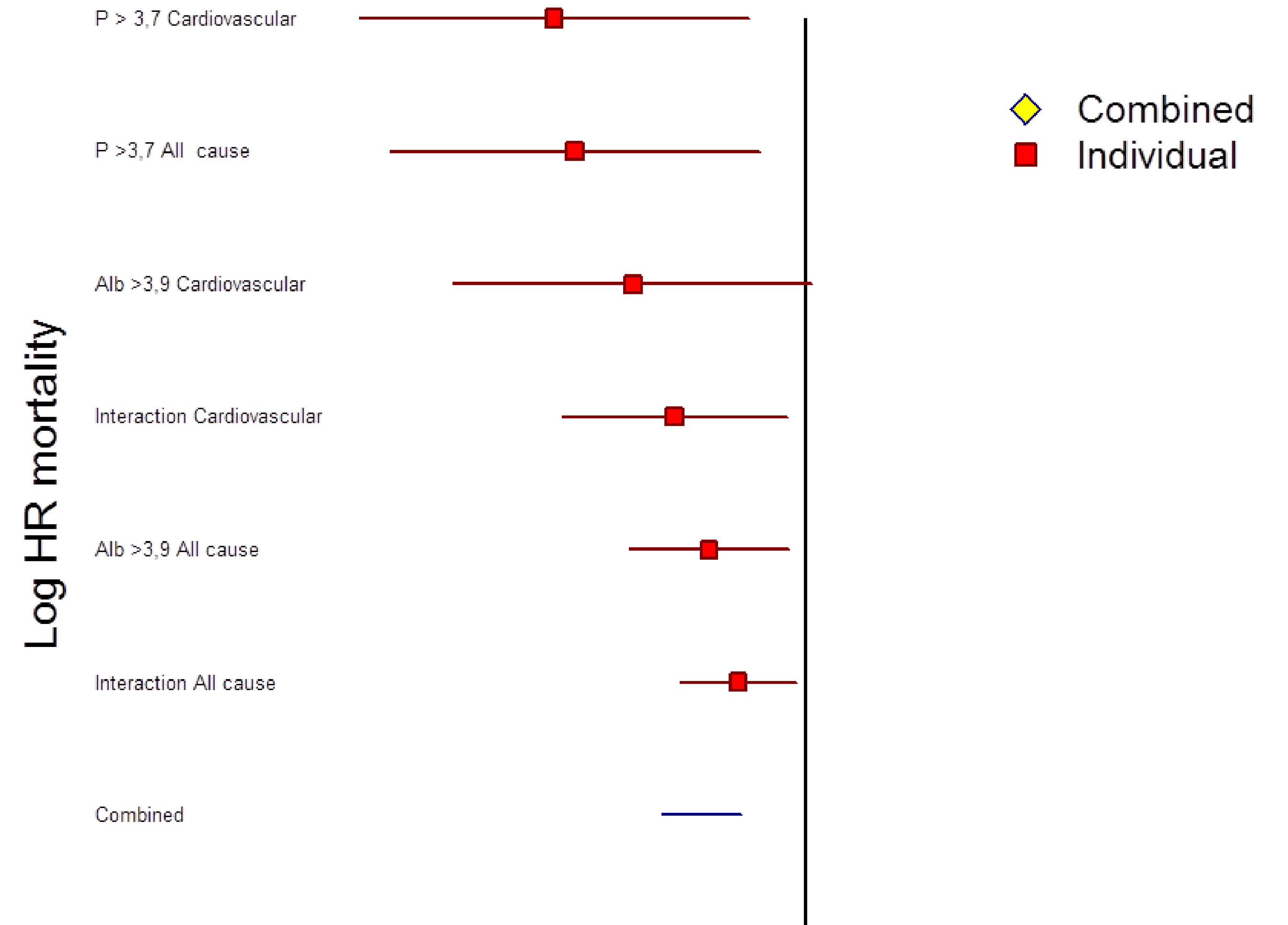
Log HR cardiovascular mortality in late group



>3,9 better

P- <3,9better

Log HR mortality and interaction in late group



>3,7 better

P- <3,7 better

