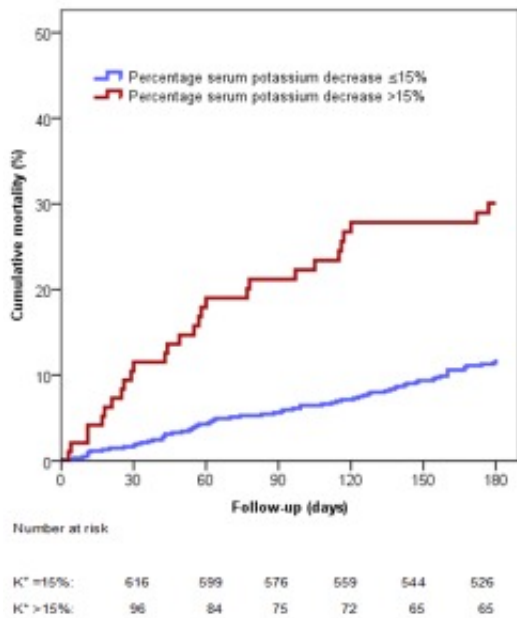


Serum potassium decline associated with increased mortality in acute heart failure

Acute heart failure (HF) is the most important reason for hospitalization in the United States and Europe. It is associated with high morbidity and mortality, most conspicuously in the first months after discharge. As HF progresses, and diuretics are given, there will be an increase of sodium delivery to the renal tubules, which is exchanged again for potassium and causes a loss of potassium in the urine. This background vulnerability for serum potassium changes is even increased during admissions for HF. There is limited data available regarding the role of serum potassium changes during hospitalization for acute HF. In our study, we evaluated the relationship between serum potassium changes during hospitalization and mortality after discharge at 6-months in patients hospitalized for acute HF. Our study, assembled from three prospective cohorts from Europe, comprised 754 patients hospitalized for acute HF.



The figure shows Kaplan-Meier survival analysis for 6 months mortality and serum potassium (K⁺) decrease during hospitalization. A decrease of more than 15% in serum potassium levels is associated with a doubling of mortality (unadjusted).

We demonstrate that both absolute and percentage decreases in serum potassium during hospitalization is a predictor for 6 months mortality. Even a minimal decrease of 0.3 mmol/L or a 5% decrease in serum potassium is associated with a doubling of mortality compared with patients without a decrease (19-22% vs. 10-12%, respectively). A percentage decrease of more than 15%

appeared as the best indicators for 6-month mortality, when all other relevant variables predicting late mortality were taken into account (potassium values at admission and discharge, NT-proBNP values, renal variables and clinical variables). We argue in our study that the loss of potassium in these patients may be the result of higher aldosterone levels at admission or a steeper increase in aldosterone during the hospitalization. Aldosterone is a hormone that is released in the blood when there is diminished circulation and higher levels indicate more severe heart failure; it stimulates sodium retention and potassium excretion. Aldosterone antagonists were already used in the study, however even in patients who were discharged with aldosterone antagonists, potassium loss was observed and contributed to mortality. In this respect, future studies may consider to up-titrate the aldosterone antagonist temporarily during admissions or follow potassium decreases during admissions to timely start an aldosterone antagonist. In conclusion, our data shows that a fall of more than 15% in serum potassium level is independently associated with a significant increase in mortality within 6 months after discharge from hospital. This suggests that monitoring and regulation of the serum potassium level during hospitalizations is necessary.

Publication

[Serum potassium decline during hospitalization for acute decompensated heart failure is a predictor of 6-month mortality, independent of N-terminal pro-B-type natriuretic peptide levels: An individual patient data analysis.](#)

Salah K, Pinto YM, Eurlings LW, Metra M, Stienen S, Lombardi C, Tijssen JG, Kok WE
Am Heart J. 2015 Sep