

# Impact of Renal Impairment on Outcomes and Management of Admissions with Heart Failure

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## INTRODUCTION AND AIMS

Patients admitted with heart failure have poor outcomes and variable quality of clinical care[1]. Large meta-analyses have shown renal impairment is common in patients admitted with heart failure and carries adverse prognostic implications [2]. Understanding optimal clinical management of this subgroup, particularly those with severe renal impairment, is limited by lack of good quality interventional trial evidence and anxiety about side effects [3,4]. We sought to determine the impact of acute and chronic renal impairment on outcomes and management in patients admitted to one trust with heart failure.

## METHODS

We performed an analysis of retrospectively collected data on unscheduled admissions to a Teaching Hospital discharged with a primary diagnosis of heart failure from April 2013 – April 2015 inclusive. Data was collected in accordance with the National Heart Failure Audit [1]. Creatinine levels were recorded on discharge. Baseline creatinine levels (3-12 months prior to admission) were obtained from patient notes. Estimated glomerular filtration rate (eGFR) was calculated using the MDRD formula [5] and converted to Chronic Kidney Disease (CKD) using KDIGO criteria [6]. Severity of Acute Kidney Injury (AKI) was determined by change from baseline to discharge creatinine using KDIGO criteria [7].

## RESULTS

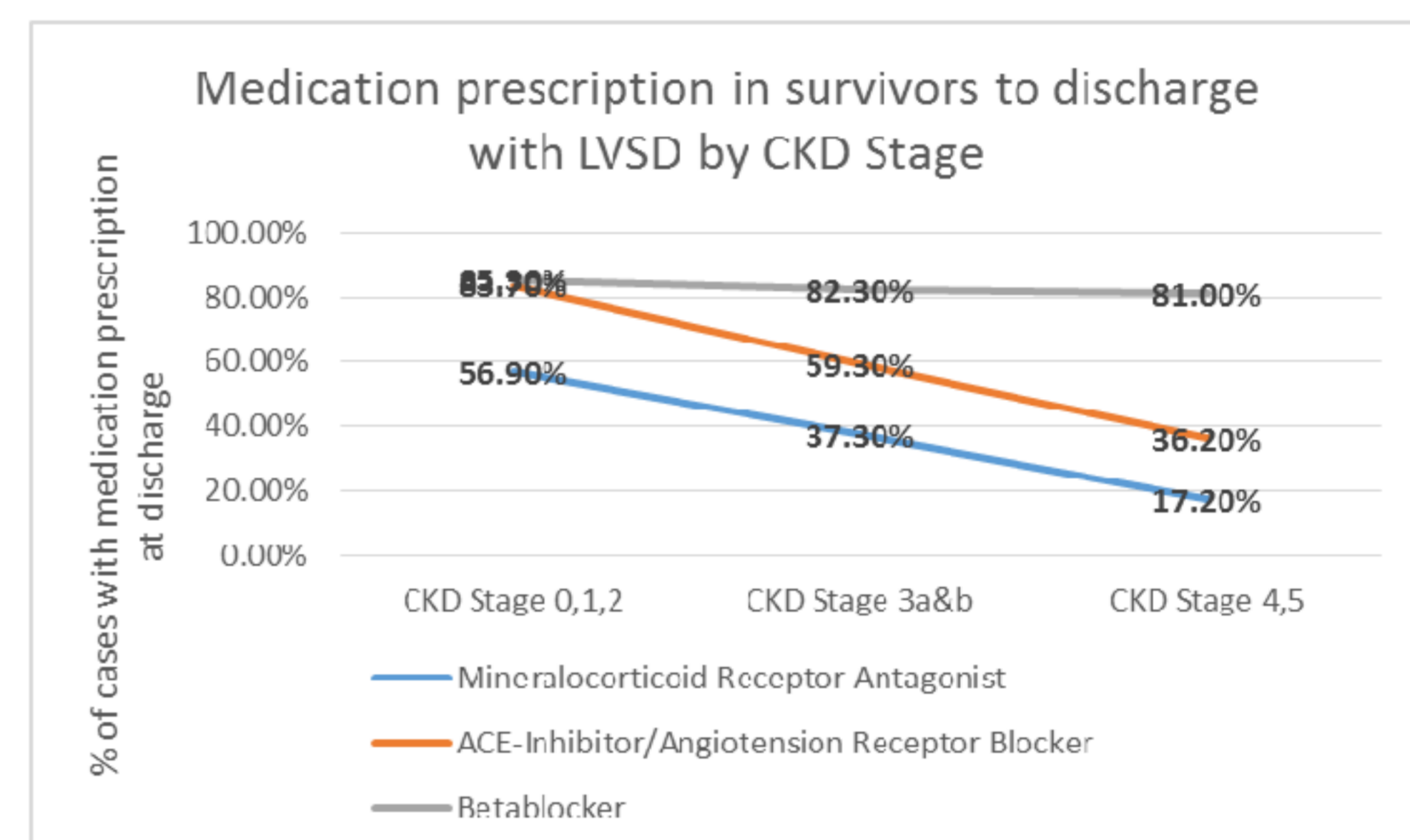
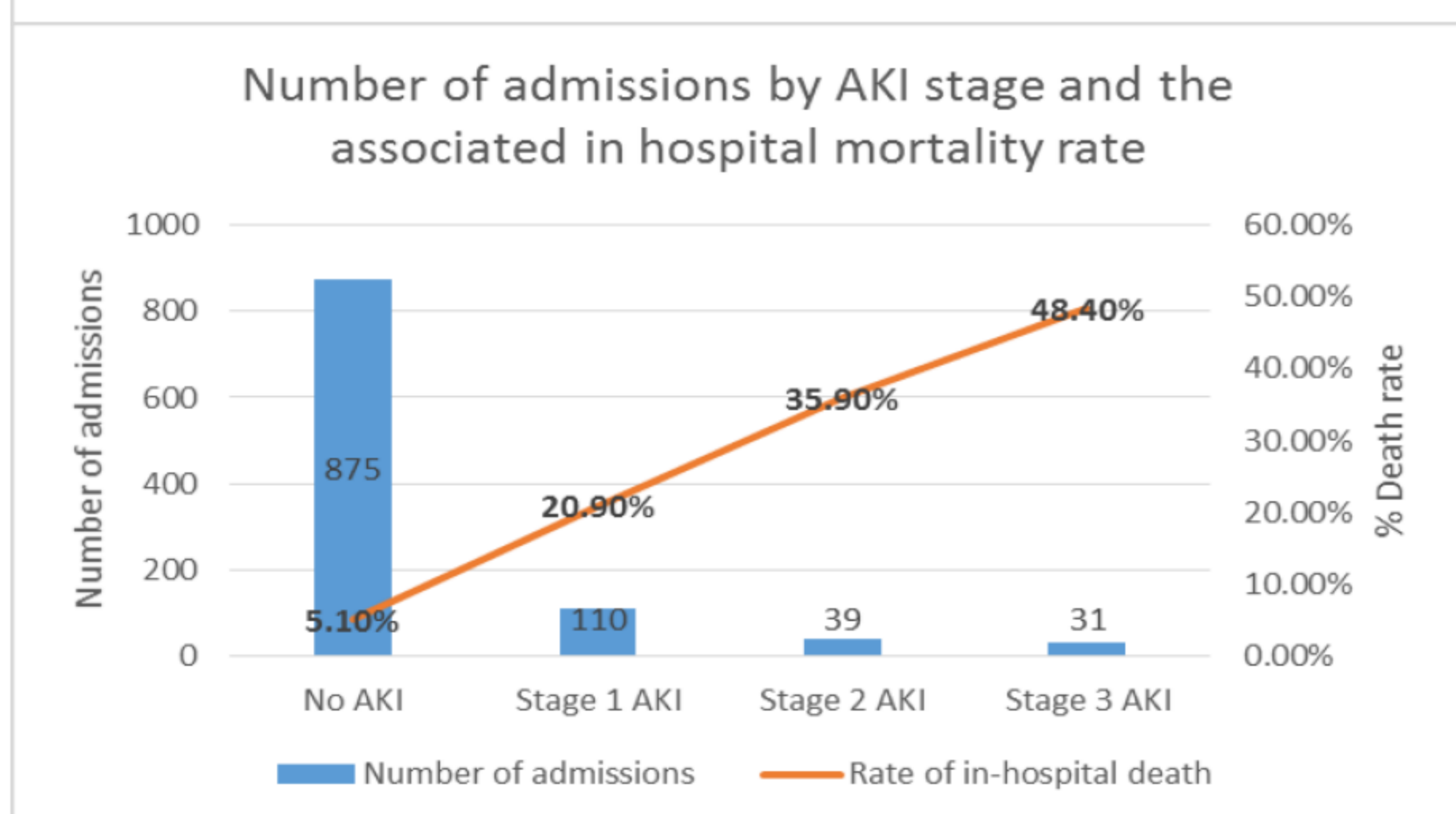
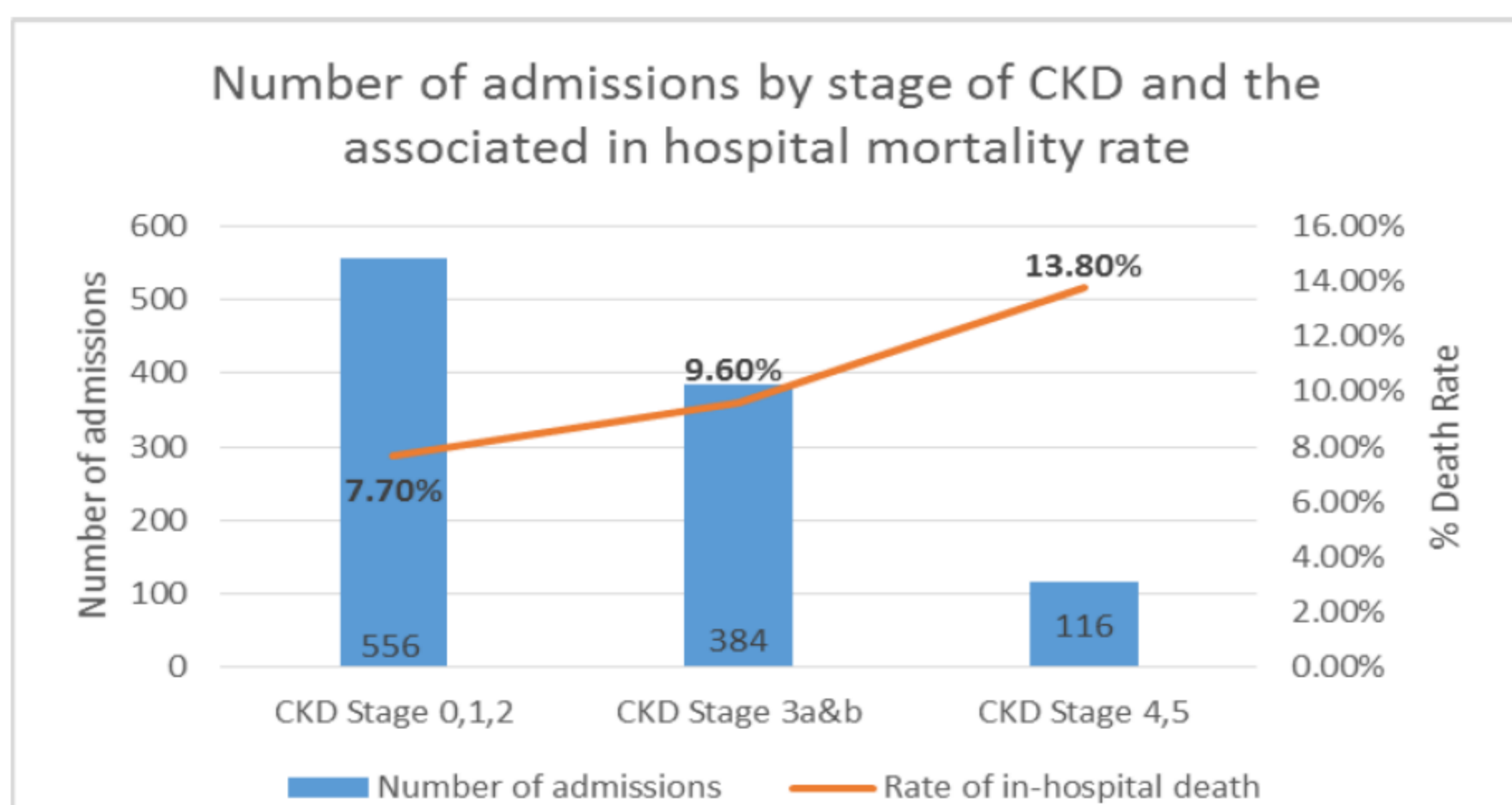
We analysed data from **1056** admissions; 851 individual patients.

Total Population	n=851	
Age	Mean 76 +/- 13 years	
Sex	55.8% Male	
Ethnicity	56.4% Caucasian	16.9% Asian
	12.2% Black	14.5% Other
Comorbidity	36.2% Diabetes mellitus	
	54.5% Ischaemic heart disease	
	57.3% Valvular heart disease	
	63.6% Hypertension	
Place of Care	61.7% General medical ward	
	31.7% Cardiology ward	

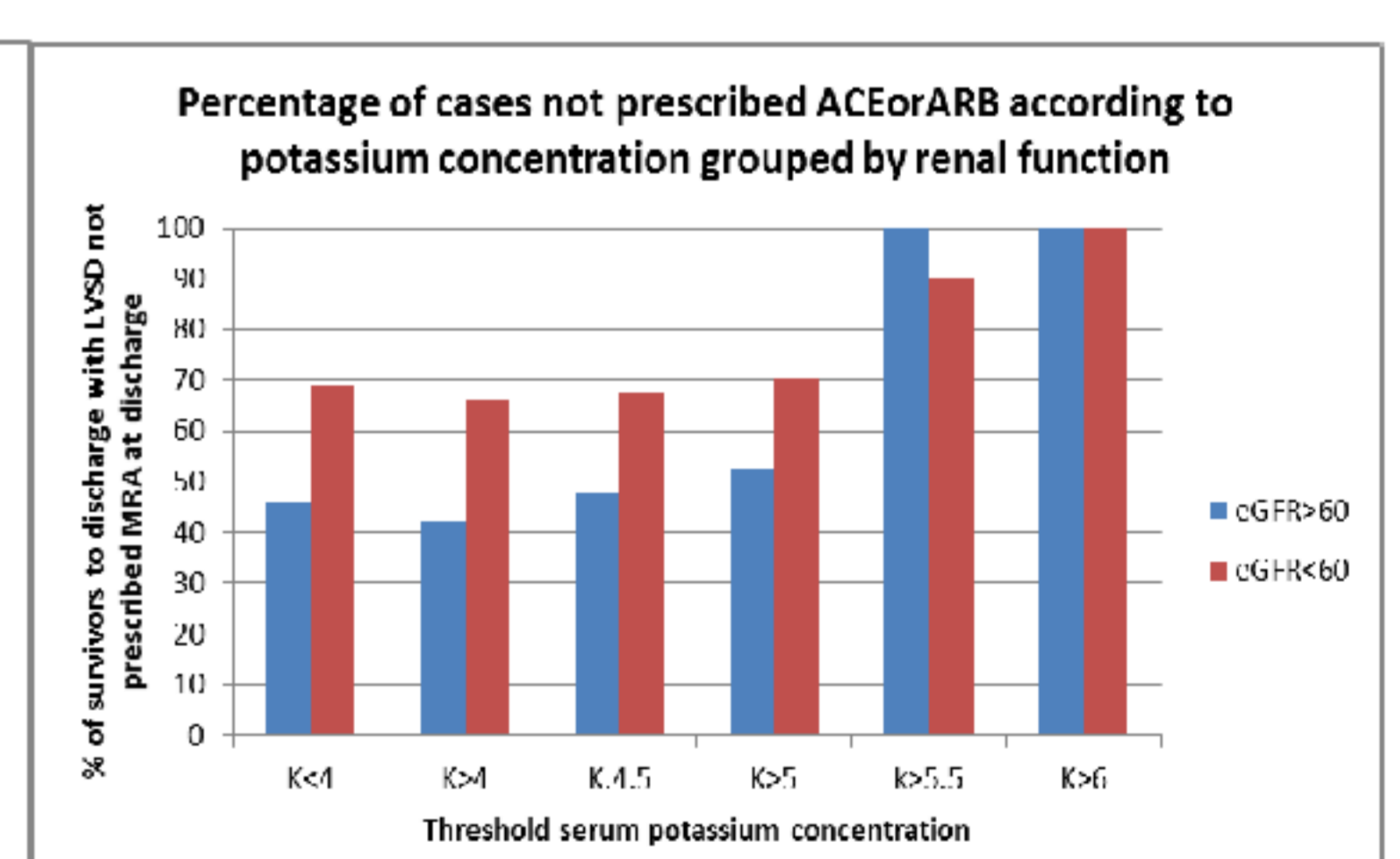
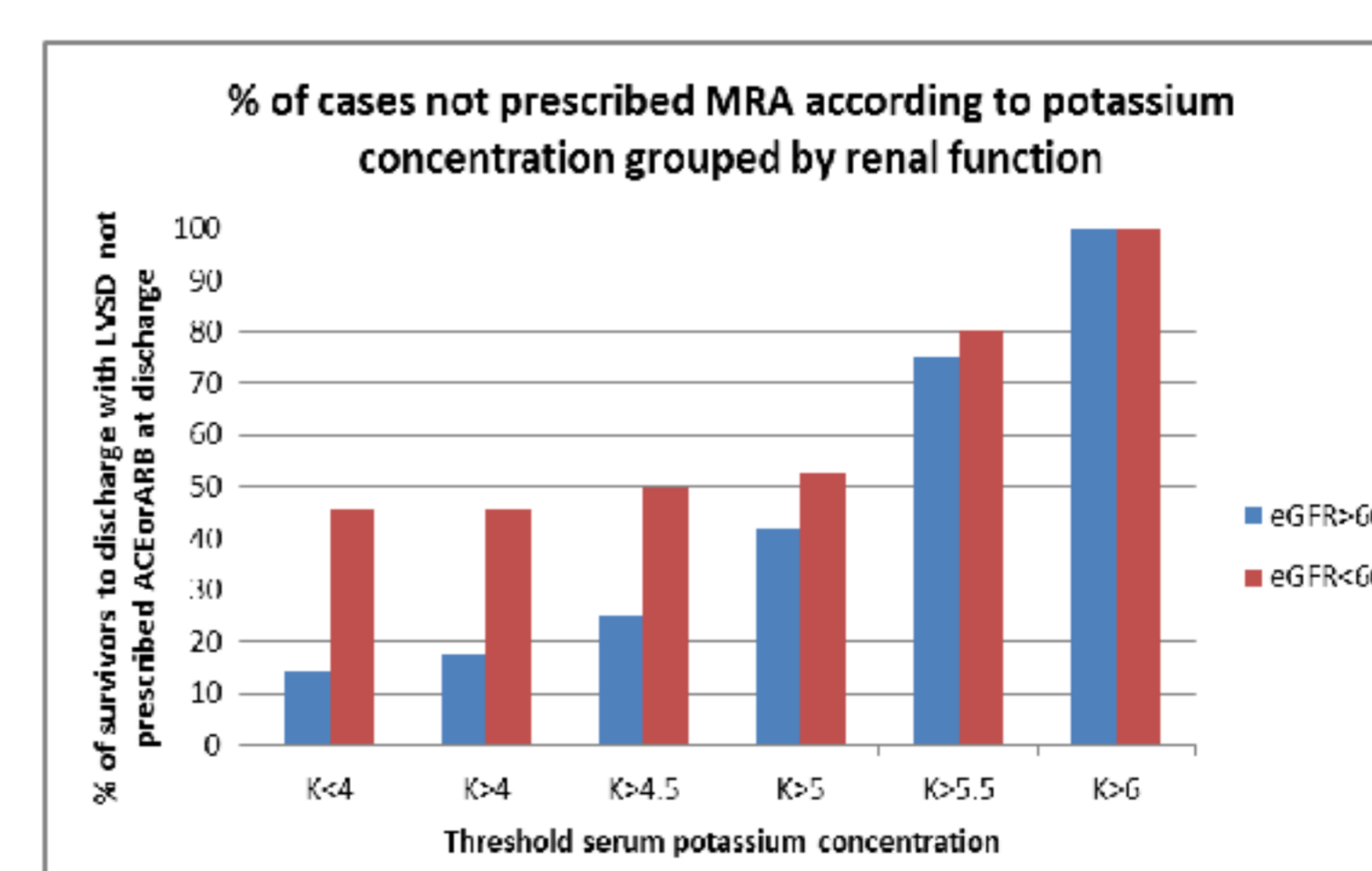
Baseline renal function was available in 954 (90.3%) of admissions, if unavailable eGFR was assumed to be >90ml/min/1.73m<sup>2</sup>. Below shows that whilst more advanced CKD stages were less common, there was an increased rate of in-hospital death. AKI was relatively rare, but again there was a high associated rate of in-hospital death.

Logistic regression analysis showed AKI and severe CKD remained independent predictors of in-hospital death after correcting for age, diabetes mellitus and left ventricular systolic function (LVSD).

Medications prescribed on discharge were analysed in those survivors to discharge with LVSD (n=555). The prescription of certain medications – ACE-inhibitor/angiotensin receptor blocker (ACEorARB) and mineralocorticoid receptor blocker (MRA) - was significantly reduced as CKD Stage advanced.



The rate of prescription of ACEorARB and MRA was analysed by serum potassium concentration [K]. A significant proportion of patients with [K] in the normal or mildly raised range had these medications omitted. This number was higher in those with eGFR <60ml/min/1.73m<sup>2</sup>.



## CONCLUSIONS

- Both chronic and acute renal impairment are associated with adverse outcomes in heart failure admissions.
- The presence of chronic renal impairment is associated with significantly differing management which is not purely explained by the presence of hyperkalaemia.
- Improving outcomes for these patients with renal impairment and heart failure continues to represent significant challenges. There is an urgent need for better evidence on the safety and benefits of heart failure therapy in renal impairment.

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