Healthcare Costs and All-cause Mortality Following a Hyperkalaemia Event and Reduction of RAASi Therapy in Sweden

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Maria K. Svensson,[1] Kun Kim,[2,3] Thomas Cars,[4] Naveen Rao,[5] Eva Lesén,[6] Krister Järbrink[6]

[1]Department of Medical Sciences, Renal Medicine, Uppsala University, Uppsala, Sweden; [2]Health Economics, AstraZeneca, Stockholm, Sweden; [3]Department of Neurobiology, Care Sciences and Society, Karolinska Institute, Sweden; [4]Sence Research AB, Uppsala, Sweden; [5]Health Economics and Payer Evidence CVRM, AstraZeneca, Cambridge, UK; [6]CVRM Evidence, AstraZeneca, Gothenburg, Sweden

Introduction

- Guidelines recommend use of renin-angiotensin-aldosterone system inhibitor (RAASi) therapy at the maximum tolerated dose to achieve optimal cardiorenal benefit in patients with chronic kidney disease (CKD) and/or heart failure (HF).[1–4]
- Risk of hyperkalemia (HK) presents a barrier to achieving guideline-directed target dosing with RAASi; with RAASi often being discontinued or down-titrated.[5]
- Current international guidelines recommend the use of novel potassium binders to manage HK and facilitate RAASi therapy optimization in individuals with CKD and/or HF.[1–4]

Aims

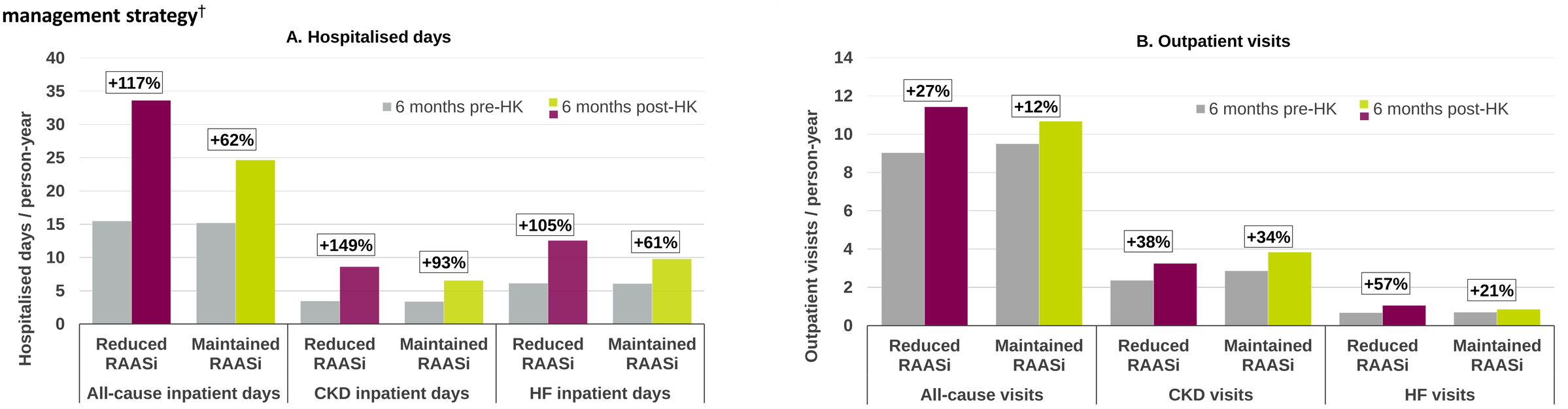
To assess healthcare costs and all-cause mortality associated with reduced RAASi treatment following a HK event in Swedish patients with CKD and/or HF.

Methods

- This observational study used data from national registries linked with health records from two large Swedish regions (Stockholm and Skåne).
- Inclusion criteria:
  - Patients aged ≥18 years with HF and/or CKD, and RAASi use at baseline.
  - Index HK event (ICD-10 code E87.5) or serum potassium >5.0 mmol/L during Mar 2018−Jul 2020.
- Propensity score matching (1:1) was used to balance the cohorts who reduced versus maintained their pre-HK RAASi treatment on demographics, comorbidities, baseline medications (incl. RAASi), and hospitalised days prior to index.
- Change in healthcare utilisation was measured as outpatient visits and hospitalised days (all-cause and related to CKD and HF) per person-year within 6 months before vs after the index HK event.
- Costs were based on national DRG-weights and 2021 years national cost in Swedish krona (SEK).
- Days Alive Outside Hospital (DAOH) was calculated for each individual patient, as total follow-up time (6 months) – (days in hospital + days beyond the date of death until 6 months after index). Patients who were lost to follow-up within these 6 months were excluded from these analyses.
- All-cause mortality within 6 months after index was analysed using the Kaplan-Meier method.

Results

Figure 1A and 1B. Hospitalised days (A) and outpatient visits (B) per person-year during 6 months before and 6 months after the index hyperkalemia event, by RAASi management strategy†



The propensity score matched cohorts included 6998 patients each. †Patients were defined as having reduced or maintained their pre-HK RAASi therapy based on filled prescriptions, or lack thereof within 120 days pre- versus post HK index event.
CKD, chronic kidney disease; RAASi, renin-angiotensin-aldosterone system inhibitor.

Figure 2. Healthcare costs 6 months before and after a hyperkalemia event, per person-year

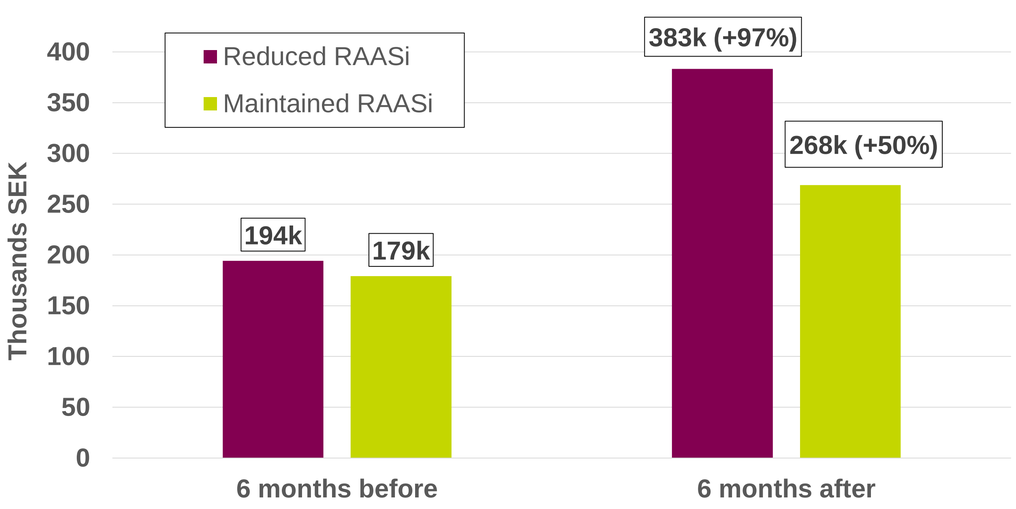
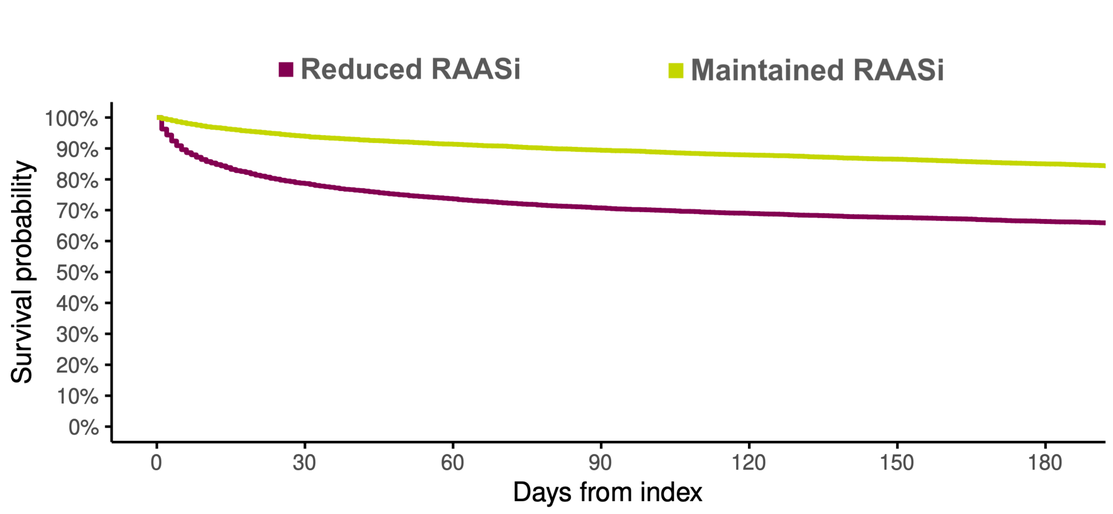


Figure 3. Survival within 6 months from the hyperkalemia event, by RAASi treatment strategy



- Following matching, 6998 patients remained in each group (maintained vs. reduced RAASi) and the cohorts were well balanced (e.g. mean age 76.7 vs 76.8 years, female 42.9 vs 42.4%, mild HK 63.8 vs 61.0%, CKD stage 3 50.9 vs 51.5%, HF 58.9 vs 57.7% and diabetes 44.8 vs 45.1%).
- During the six months following the index HK event, all-cause inpatient bed-days increased by 117% among patients who reduced their RAASi treatment and by 62% among those who maintained compared to 6 months before the hyperkalemia event (**Figure 1A**). Similarly, all-cause outpatient visits per person-year showed an increase of 27% in those who reduced RAASi vs. 12% in those who maintained (**Figure 1B**).
- The healthcare costs increased from 6 months before to 6 months after the hyperkalemia event by 97% in those who reduced and with 50% in those who maintained RAASi treatment, corresponding to a 47% higher absolute difference (**Figure 2**).
- Patients who reduced RAASi were on average alive 121.5 (SD 75.0) days outside the hospital, compared to 154.0 (SD 51.3) in those who maintained RAASi.
- The survival rate at 6 months was 0.663 (CI: 0.652-0.674) among those who reduced their RAASi therapy compared to 0.850 (CI: 0.842-0.858) among those that maintained (**Figure 3**).

Conclusion

In clinical practice, reducing RAASi therapy after a hyperkalemia event is associated with increased healthcare costs and an increased risk of all-cause mortality. These findings indicate a need for improved guidelines adherence in targeted management of HK to facilitate maintained RAASi therapy and achieve optimal treatment outcomes for patients with CKD or HF.

References

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Contact information: Krister.jarbrink1@astrazeneca.com

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