Association between heart failure medication at discharge and heart failure readmission

WJ Kruik-Kollöffel[1,2], J van der Palen[3,4], CJM Doggen[5], HJ Kruik[6], EM Heintjes[7], KLL Movig[8], GCM Linssen[6]

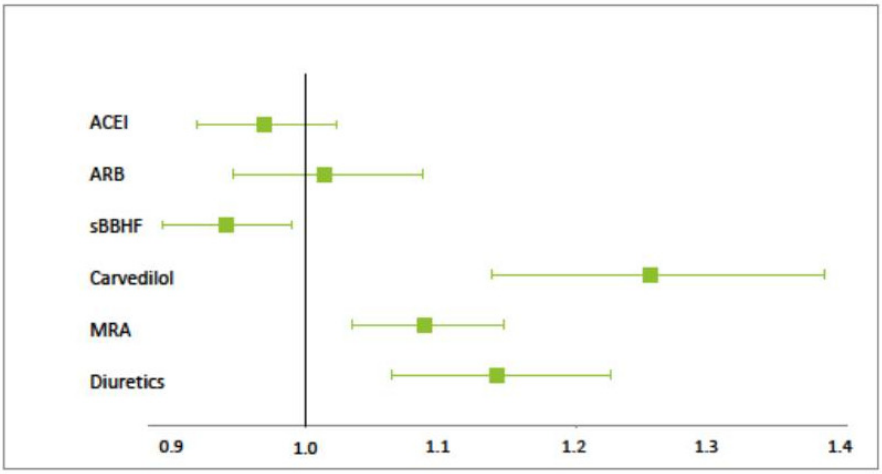
1: Department of Clinical Pharmacy, Saxenburgh Group, Hardenberg. 2: Department of Clinical Pharmacy, Hospital Group Twente, Almelo and Hengelo. 3: Medical School Twente, Medisch Spectrum Twente, Enschede. 4: Department of Research Methodology, Measurement and Data Analysis, University of Twente, Enschede. 5: Department of Health Technology and Services Research, Technical Medical Centre, University of Twente, Enschede. 6: Department of Cardiology, Hospital Group Twente, Almelo and Hengelo. 7: Pharmo Institute, Utrecht. 8: Department of Clinical Pharmacy, Medisch Spectrum Twente, Enschede, **the Netherlands**.

Purpose

In selected groups of heart failure (HF) patients, angiotensin-converting-enzyme inhibitors (ACEI), angiotensin-receptor blockers (ARB), beta-blockers (BB) and mineralocorticoid-receptor antagonists (MRA) reduce the risk of readmission for HF. Diuretics, are indispensable for most HF patients.

Aim of this large Dutch population-based cohort study is to compare hospital readmission rates of patients with HF, prescribed core HF medications versus non-use in a real-world scenario.

Fig. Hazard ratios* of heart failure readmission and heart failure medication



*HR versus non-use; adjusted for age, gender, number of other drugs, year of admission, propensity score of particular medication (based on baseline covariates and co-medication); sBBHF: selective beta1-receptor blocker with a market autorisation for HF

Methods and results

Medication at hospital discharge based on dispensing data from the **Dutch PHARMO Database Network including 22,476 patients with a diagnosis of HF between 2001 and 2015**.

Median follow-up was 29.3 months.

One third of patients were readmitted for HF.

Propensity scores were calculated as a proxy for comorbidities and hazard ratios were adjusted (HRadj) accordingly.

ACEI and ARB were not associated with readmission. Only **β1-selective BB (sBBHF**: bisoprolol, metoprolol and nebivolol) decreased risk of readmission (HRadj 0.94; 95%CI 0.90-0.99). **Carvedilol**, a β- and partly α1-blocking agent (HRadj 1.25; 95%CI 1.14-1.38), MRA (HRadj 1.09; 95%CI 1.03-1.15) and **diuretics** (HRadj 1.14; 95%CI 1.06-1.23) were associated with an increased risk of readmission (Fig.).

Baseline characteristics	
Total number of patients	22,476
Patients readmitted %	29.9%
Age: mean (SD)	76.8 (10.9)
Gender: female %	50.9%
Length of stay in hospital (days)	6 (3-11)
Medication profile on discharge	
ACEI/ARB	62.7%
• ACEI	47.1%
• ARB	17.3%
Beta-blocker	59.6%
• sBBHF	46.0%
• Carvedilol	5.4%
MRA	37.0%
Diuretics	81.8%

Conclusions

Selective beta-blockers for HF might be preferred to the non-selective beta-blocker carvedilol whereas these are considered equivalent in current guidelines. Further investigations are necessary to confirm our results in other real-world HF cohorts.

E-mail: ***w.kruik@sxb.nl***

Conflicts of interest for all authors: none declared