

Influence of Renal Dysfunction on Clinical Outcomes in Patients with Congestive Heart Failure Complicating Acute Myocardial Infarction

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OBJECTIVES

- Patients with acute myocardial infarctions (AMIs) frequently show evidence of congestive heart failure (CHF) and have a high risk of morbidity and mortality.
- The clinical course and medical treatment of patients with CHF complicating AMI are not well established, especially in patients with concomitant renal dysfunction.

METHODS

- A final population 2769 AMI patients with CHF (Killip class II or III, Killip class IV patients were excluded due to cardiogenic shock) were analyzed in this study to use prospective Korea Acute Myocardial Infarction Registry.
- Patients were grouped based on the presence or absence of renal dysfunction. (eGFR of <60 mL/(min/1.73 m², calculated using CKD-EPI).
- The primary endpoints: major adverse cardiac events (MACE) including a composite of all cause-of-death, myocardial infarction, target lesion revascularization, and coronary artery bypass graft during 1-year clinical follow-up.

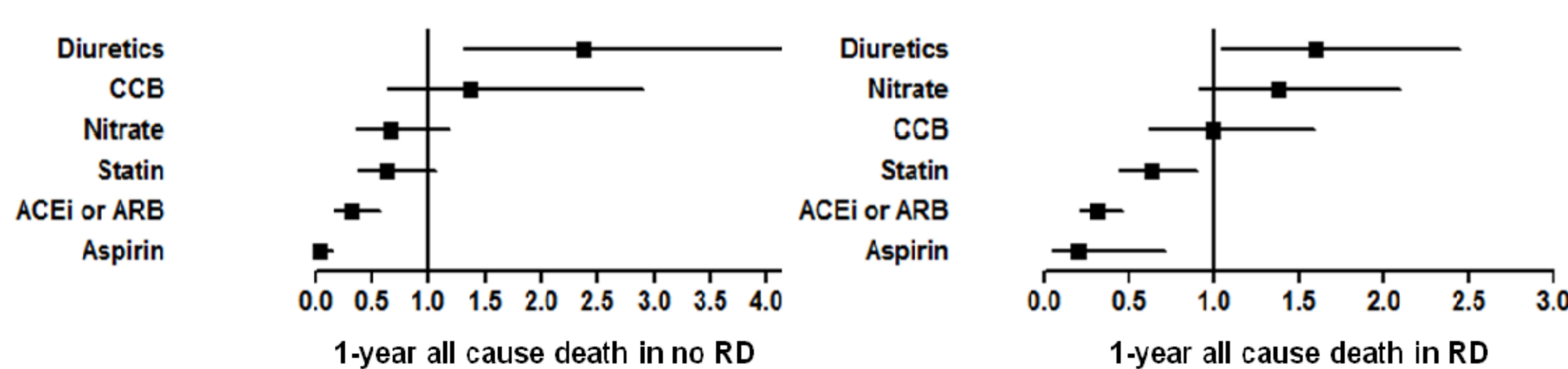
Table 1. Baseline clinical characteristics

| | Congestive heart failure | | P value |
|--|--------------------------------|-----------------------------|---------|
| | No-Renal dysfunction (N=1,615) | Renal dysfunction (N=1,154) | |
| Age (years) | 64±12 | 73±10 | <0.001 |
| Male (%) | 1128(69.9) | 579(51.8) | <0.001 |
| Diabetes mellitus (%) | 442(27.4) | 537(46.6) | <0.001 |
| Previous hypertension (%) | 684(42.5) | 768(66.6) | <0.001 |
| Previous dyslipidemia (%) | 120(7.5) | 131(11.4) | <0.001 |
| Killip class II (%) | 1099(68.2) | 576(49.9) | <0.001 |
| Killip class III (%) | 516(32.0) | 578(50.1) | <0.001 |
| Admission rate of CCU (%) | 1339(82.9) | 968(83.9) | 0.158 |
| Lengths of CCU stay (day) | 4.3±7.8 | 6.1±7.8 | <0.001 |
| Serum Creatinine (mg/dL) | 0.9±0.2 | 2.3±3.3 | <0.001 |
| Estimated GFR (ml/min/1.73m ²) | 82±16 | 38±16 | <0.001 |

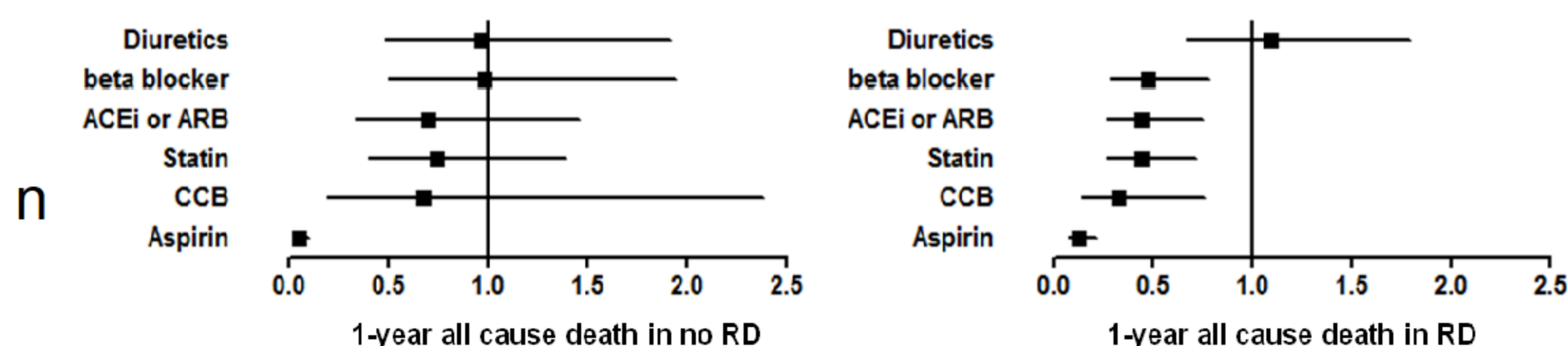
Table 2. Clinical outcomes during the in-hospital period and follow up

| | Congestive heart failure | | P value |
|-----------------------------|--------------------------|-------------------|---------|
| | No-Renal dysfunction | Renal dysfunction | |
| In-hospital outcomes | | | |
| In-hospital death (%) | 76(4.7) | 175(15.2) | <0.001 |
| 1-month outcomes | | | |
| Composite MACE (%) | 135(9.4) | 248(24.8) | <0.001 |
| Death (%) | 103(7.2) | 228(22.8) | <0.001 |
| MI (%) | 8(0.6) | 10(1.0) | 0.234 |
| Re-PCI (%) | 18(1.3) | 6(0.6) | 0.114 |
| CABG (%) | 6(0.4) | 4(0.4) | 0.947 |
| 12-month outcomes | | | |
| Composite MACE (%) | 225(18.1) | 337(38.3) | <0.001 |
| Death (%) | 135(10.9) | 288(32.7) | <0.001 |
| MI (%) | 9(0.7) | 13(1.5) | 0.126 |
| Re-PCI (%) | 70(5.6) | 30(3.4) | 0.017 |
| CABG (%) | 11(0.9) | 6(0.7) | 0.806 |

A. In hospital medication



B. Discharge medication



RESULTS

- Of 13,498 patients with AMI, 2769 (20.5%) had CHF on admission.
- Compared to CHF patients with preserved renal function, patients with renal dysfunction (1154; 41.7%) were increased in-hospital mortality and major adverse cardiac events both at 1 month and at 1 year after discharge.
- Postdischarge use of aspirin, beta-blockers, calcium channel blockers, angiotensin-converting enzyme inhibitors, or angiotensin II receptor blockers and statins significantly reduced the 1-year mortality rate for CHF patients with renal dysfunction
- Such reduction was not observed for those without renal dysfunction, except in the case of aspirin.

CONCLUSIONS

- Patients with CHF complicated with AMI accompanied by renal dysfunction are at higher risk for adverse cardiovascular outcomes.
- Nonetheless, medications that have proven benefits with respect to mortality are underused in these patients.
- Therefore, early identification of patients with renal dysfunction and intensive medical treatment for this population may reduce cardiovascular outcomes and mortality.

