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# Circulating concentration of presepsin improves early prediction of short-term mortality in patients treated at medical cardiac intensive care units

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**Background:** Presepsin, a subtype of soluble CD14, is an inflammatory marker, which largely reflects monocytic activation. Presepsin appears to be an accurate diagnostic marker of sepsis, but its clinical significance remains unclear in cardiovascular disease.

**Purpose:** This prospective study aimed to investigate the predictive value of plasma presepsin levels on admission to medical (non-surgical) cardiac intensive care units (MCICUs) for short-term mortality.

**Methods:** We examined 1560 patients hospitalized in MCICUs and measured the baseline plasma presepsin levels at admission.

**Results:** Acute coronary syndrome was present in 46% of the patients, and acute decompensated heart failure in 36%. Before MCICUs admission, emergent coronary angiography or percutaneous coronary intervention was performed in 36%, mechanical ventilation was required for respiratory insufficiency in 2.1%, and intraaortic balloon pumps were needed for hemodynamic instability in 8.9%. During 6 months after admission, there were 113 (7.2%) deaths. Patients who died were older (median: 77 vs. 71 years, $P<0.0001$); had higher levels of presepsin (263 vs. 119 pg/mL, $P<0.0001$), B-type natriuretic peptide (BNP: 696 vs. 186 pg/mL, $P<0.0001$), high-sensitivity troponin T (hsTnT: 81 vs. 47 pg/mL, P=0.004), and high-sensitivity C-reactive protein (13.8 vs. 2.2 mg/L, $P<0.0001$); and had lower levels of estimated glomerular filtration rate (50 vs. 65 mL/min/1.73m$^2$, $P<0.0001$) and left ventricular ejection fraction (43% vs. 51%, $P<0.0001$) than those of the survivors. In the multivariate Cox regression analysis, higher levels of presepsin (P=0.0002), BNP (P=0.04), and hsTnT (P=0.009) were all independent predictors of 6-month deaths. Quartiles of presepsin levels were associated with higher mortality rates within 6 months after admission (Table). Adding presepsin levels to a baseline model that included established risk factors, BNP, and hsTnT further enhanced reclassification (P=0.004) and discrimination (P=0.003) beyond that of the baseline model.

**Conclusions:** Presepsin levels at admission could improve the prediction of short-term mortality in patients hospitalized at MCICUs.

Mortality rates according to presepsin

| Presepsin quartile | 1st ≤80 pg/mL | 2nd 81–124 pg/mL | 3rd 125–232 pg/mL | 4th >232 pg/mL | P value |
|---|---|---|---|---|---|
| 1-month mortality | 0.8% | 2.0% | 3.3% | 8.0% | <0.0001 |
| 6-month mortality | 0.8% | 3.8% | 8.2% | 16.3% | <0.0001 |