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## **Impact of Statin Use Prior to Sepsis on Kidney and Mortality Outcomes: Insights from a Cause-Specific Analysis with Overlap Weighting**

Min Woo Kang

Department of Internal Medicine-Nephrology, Korea University Guro Hospital, Korea, Republic of

**Objectives :** Sepsis, frequently complicated by kidney injury, poses a significant mortality risk in intensive care unit (ICU) patients. While statins are thought to offer protective effects against kidney injury through anti-inflammatory and vascular mechanisms, evidence remains inconclusive. This study aimed to evaluate whether statin use prior to sepsis onset impacts the risks of kidney injury and mortality.

**Methods :** This retrospective cohort study used data from the Medical Information Mart for Intensive Care (MIMIC)-IV database, including ICU patients diagnosed with sepsis according to Sepsis-3 criteria. Patients who received statins within 24 hours before sepsis diagnosis were classified as the exposure group. Outcomes included kidney outcome (defined as the need for kidney replacement therapy or a reduction in estimated glomerular filtration rate of  $\geq 50\%$ ), mortality without kidney outcome, and overall mortality, analyzed using cause-specific survival analysis using overlap weights. Overlap weights were estimated from a logistic regression adjusted for age, sex, weight, hypertension, diabetes, hypercholesterolemia, chronic kidney disease (CKD), myocardial infarction, congestive heart failure, cerebrovascular disease, and peripheral vascular disease.

**Results :** The final cohort included 30,971 septic patients, with 19.3% exposed to statins. Statin use was associated with a reduced risk of kidney outcome (hazard ratio [HR]: 0.89 [0.84–0.93]), mortality without kidney outcome (HR: 0.60 [0.54–0.67]), and overall mortality (HR: 0.78 [0.71–0.84]). Subgroup analysis showed that statin use reduced kidney outcome risk across most subgroups, though not significantly in patients aged  $\geq 65$  or those with CKD. Statin use consistently reduced mortality, independent of kidney outcome status, across all subgroups stratified by age ( $\geq 65$  vs.  $<65$  years), CKD, hypercholesterolemia, diabetes, hypertension, and myocardial infarction.

**Conclusions :** This study suggests that statin use prior to sepsis onset may reduce the risks of kidney injury and mortality, indicating potential clinical benefits in septic patients.

Figure 1.jpg

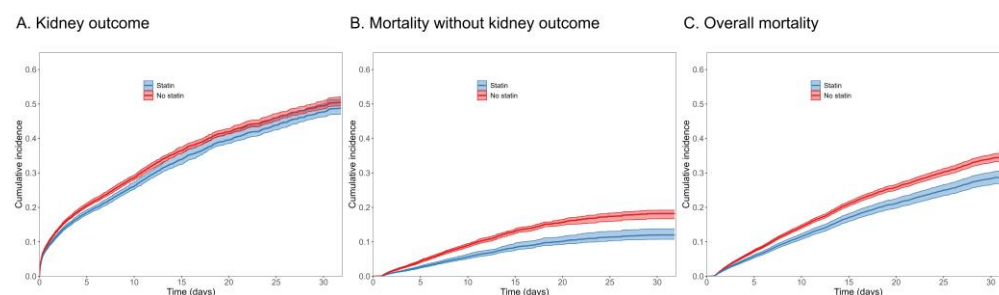
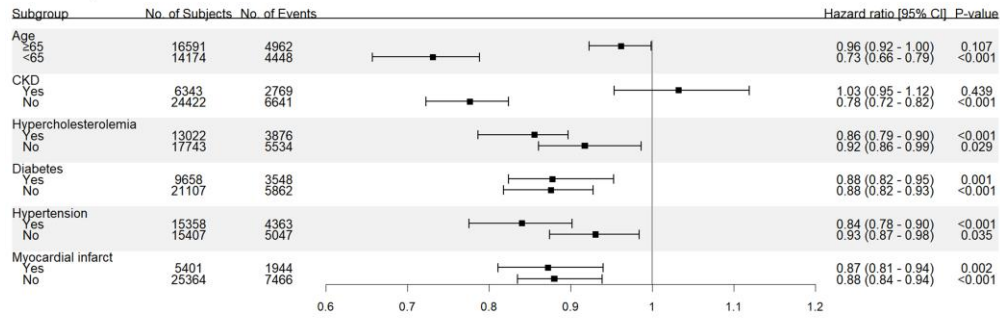


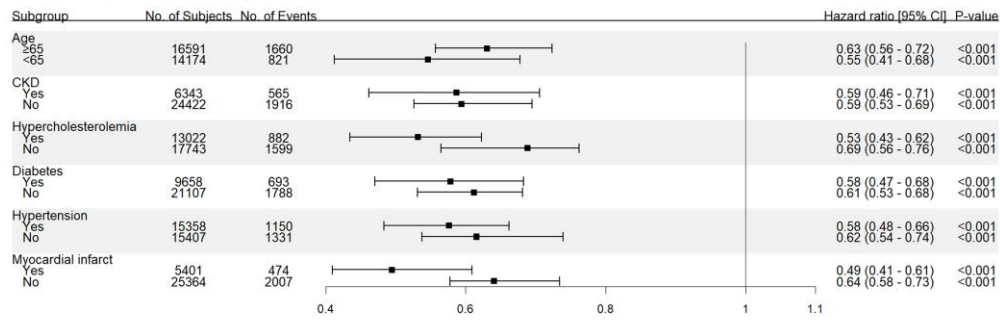


Figure 1.jpg

A. Kidney outcome



B. Mortality without kidney outcome



C. Overall mortality

