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The Impact of Statin Therapy on Mortality and Cardiovascular Outcomes in Dialysis Patients with Atherosclerotic Cardiovascular Disease: A Systematic Review and Meta-Analysis

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Objectives : Statin therapy is a cornerstone in reducing cardiovascular risk in patients with atherosclerotic cardiovascular disease (ASCVD). However, current clinical guidelines don’t recommend statin use in patients undergoing maintenance dialysis due to inconclusive evidence. We conducted a meta-analysis to assess the clinical effectiveness of statins in patients with established ASCVD and undergoing dialysis.
Methods : We systematically searched PubMed, Scopus, and Web of Science (WOS) from inception until December 10, 2024. We utilized Review Manager (RevMan 5.4 for Windows) to calculate the hazard ratios (HRs) or odds ratios (ORs) along with their corresponding confidence interval (95% CI).
Results : Seven observational studies comprising 116,535 patients met our inclusion criteria for the meta-analysis. Statin therapy was associated with a significant reduction in all-cause mortality (HR = 0.94, 95% CI: 0.89–0.98, P = 0.004) and major adverse cardiovascular events (MACE) (HR = 0.89, 95% CI: 0.80–0.98, P = 0.02). However, no significant associations were observed for cardiovascular mortality (HR = 0.92, 95% CI = [0.69, 1.24], P = 0.60), myoacardial infarction (OR = 1.23, 95% CI = [0.99, 1.53], P = 0.06), or stroke (HR = 0.99, 95% CI = [0.79, 1.24], P = 0.92).
Conclusions : This meta-analysis showed that statin therapy can reduce all-cause mortality and MACE in dialysis-dependent patients with ASCVD. However, it does not significantly impact cardiovascular mortality or stroke. Given the observational nature of the included studies, high-quality prospective trials are warranted to reassess current guidelines and refine treatment recommendations.

Forest plot all cause mortality hazards ratio.png

Study or Subgroup	log[Hazard Ratio]	SE	Weight	Hazard Ratio IV, Random, 95% CI
Funamizu 2022	-0.7061	0.2713	0.7%	0.49 [0.29, 0.84]
Kagawa 2014	0.5601	0.7662	0.1%	1.75 [0.39, 7.86]
Kim 2018	-0.436	0.2848	0.7%	0.65 [0.37, 1.13]
Lee 2023	-0.0679	0.0191	36.5%	0.93 [0.90, 0.97]
Lo 2022	-0.0892	0.0435	18.1%	0.91 [0.84, 1.00]
Shavadia 2021	-0.041	0.0106	43.9%	0.96 [0.94, 0.98]
Total (95% CI)			**100.0%**	**0.94 [0.89, 0.98]**

Heterogeneity: Tau² = 0.00; Chi² = 10.73, df = 5 (P = 0.06); I² = 53%
Test for overall effect: Z = 2.84 (P = 0.004)