Statin Treatment Reduces Long-Term Risk of Revision Surgery Following Total Hip Arthroplasty in Osteoarthritis Patients: A Registry-Based Study

Cesare Faldini[1], Claudio D'Agostino[1], Francesco Ursini[2], Andrea D'Amuri[3], Barbara Bordini[4], Cristina Ancarani[1], Enrico Capozzi, Alberto Corrado Di Martino[5]

[1]Istituto Ortopedico Rizzoli, [2]Medicine and Rheumatology Unit, [3]Medical Department, General Medicine Unit, [4]Istituti Ortopedici Rizzoli via, [5]University of Bologna

INTRODUCTION:

Statins, widely used lipid-lowering drugs, have been associated with various beneficial effects. Recent research has shown a link between statins and bone metabolism, with human observational data suggesting a decreased fracture rate among statin users. Revision of total hip arthroplasty (THA) is a serious and costly medical event. Whether statins might influence THA failure is not clear. The aim of this study is to assess how the preoperative use of statins may influence the risk of THA revision in patients with hip osteoarthritis (OA).

METHODS: We performed a retrospective analysis of patients who underwent THA for OA in the Italian RIPO registry. Electronic health records were scrutinized to gather information regarding comorbidities and statin prescriptions (Figure 1). We employed propensity score (PS) matching to pair 1:1 statin users (SU) with statin non-users (SNU), considering factors such as age, sex, and the duration of follow-up (Figure 2). The survival of THA was compared between the two groups . Secondary analyses were performed to ascertain the roles of mortality, sex, indication for statin treatment, and statin potency or lipophilicity.

RESULTS:

A total of 10,927 patients were classified as SU and PS-matched with SNU. SU had a reduced risk of THA revision over a 15-year period (adjHR 0.76, 95% CI: 0.67 – 0.88; $p < 0.001$) (Figure 3). The difference in risk of THA revision in SU vs PS-matched SNU remained consistent even when we accounted for competing mortality risk (adjHR 0.78, 95% CI: 0.68 – 0.89, $p < 0.001$) (Figure 4). This observation remained consistent regardless of the indication for statin therapy (namely primary or secondary cardiovascular prevention) (Figure 5) and was more pronounced among male patients (adjHR 0.64, 95% CI: 0.52 – 0.80, $p < 0.001$) (Figure 6). Interestingly, there were no significant differences in THA survival in patients stratified for statin potency or lipophilicity (Figure 7).

DISCUSSION AND CONCLUSION:

Our study revealed a strong association between statin use and the survival of THA, with a 24% reduced risk of implant revision during a 15-year follow-up period. These findings remained consistent across various secondary analyses. Animal experiments have suggested that statins may enhance the integration of prostheses after arthroplasty, a result supported by a small case-control study where researchers observed significantly fewer cases of radiologically detectable femoral osteolysis in statin “ever-users” compared to “never-users” at the 5-year post-surgery mark. In conclusion, statin treatment appears to have a protective effect on THA survival, particularly in males. Despite the seemingly distinct nature of bone metabolism and cardiovascular function, they share many pathways and risk factors for disease development.