Use of medications and risk of revision after primary total hip arthroplasty

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ABSTRACT

The studies of this PhD project were carried out at the Department of Orthopaedic Surgery and the Department of Clinical Epidemiology, Aarhus University Hospital, Denmark.

The quality of primary total hip arthroplasty (THA) surgery in terms of implant survival has been improving during the last decades. These improvements have primarily been ascribed to technical improvements, neglecting the effect of patient-related prognostic factors on implant failure. Consequently, the information on the implications of for example drug use after primary total hip arthroplasty surgery is limited. The aims of the dissertation were therefore to examine the association between uses of 1) statins, 2) loop and thiazid diuretics, and 3) bisphosphonates and the risk of implant failure following primary THA.

All studies were conducted as nested case control studies. We used data from the Danish Hip Arthroplasty Register that was linked with four national registers in Denmark including the Danish Register of Medicinal Product Statistics, the Integrated Database for Labour Market Research, the National Registry of Patients, and the Civil Registration System.

Study I: Postoperative statin use was associated with an adjusted relative risk (RR) of revision of 0.34 (95% confidence interval (CI); 0.28-0.41) compared with never-use. In particular, statin use was associated with a reduced risk of revision due to deep infections, aseptic loosening, dislocation and periprosthetic fracture. No difference in risk of revision due to pain or implant failure was found between statin users and never-users.

Study II: Postoperative thiazid diuretic use was not associated with any risk of revision compared to non-use. Postoperative loop diuretic use was associated with an adjusted RR of revision of 1.14 (95% CI: 0.98-1.32) compared with non-use. The adjusted RR of revision due to deep infection and periprosthetic fracture in loop diuretic users was 1.71 (95% CI: 1.15-2.55) and 6.39 (95% CI: 1.84-22.21), respectively.

Study III: Use of bisphosphonates was associated with an adjusted relative risk of revision due to deep infections of 2.59 (95% CI: 1.30-6.53). Further, duration of bisphosphonates use was inversely related with the risk of revision.

In summary, this dissertation provides evidence that use of preventive medications including statins, loop diuretics and bisphosphonates are associated with the risk of revision following primary THA surgery. Information from our study could be used by clinicians to better anticipate THA patients' individual risks for implant failure and improve the quality of THA surgery. However, as these studies are observational our results concerning beneficial associations between use of medications and the risk of revision should be confirmed by further studies before applied in clinical practice.