

RISK OF REVISION IN TOTAL HIP ARTHROPLASTY WITH CERAMIC-ON-POLYETHYLENE AND METAL-ON-POLYETHYLENE BEARINGS – RESULTS FROM THE NORDIC ARTHROPLASTY REGISTER ASSOCIATION (NARA)

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Background: Ceramic heads were introduced as an alternative to metal heads in total hip arthroplasty (THA) in order to reduce wear and osteolysis which may result in aseptic loosening.

Purpose / Aim of Study: We investigated the risk of any revision of ceramic-on-polyethylene compared to metal-on-polyethylene bearings in primary THA and secondly the risk of revision due to aseptic loosening.

Materials and Methods: The study population was identified from the NARA dataset, and consisted of 310,177 patients who had undergone a primary THA with a ceramic-on-polyethylene or metal-on-polyethylene articulation because of primary osteoarthritis, femoral head osteonecrosis, arthritis, or sequelae from childhood hip disorders. The adjusted relative risk (aRR) and 95% confidence intervals for revision were assessed with regression with the pseudo-value approach and adjusted for sex, age, diagnosis, year of surgery, fixation, and femoral head size. Analyses were made separately for ceramic-on-conventional polyethylene (CoP) compared to metal-on-conventional polyethylene (MoP), and ceramic-on-crosslinked polyethylene (CoXLP) compared to metal-on-crosslinked polyethylene (MoXLP).

Findings / Results: CoP vs. MoP: 24,018 had CoP and 166,402 MoP bearings and were followed up to 20 years. At 20 years, the aRR for any revision was 1.04 (1.01-1.07) for CoP compared to MoP. There was no difference in aRR for revision due to aseptic loosening. CoXLP vs. MoXLP: 25,070 had CoXLP and 94,687 MoXLP bearings and were followed up to 12 years. At 12 years, the aRR for any revision was 0.99 (0.97-1.02) for CoXLP compared to MoXLP. There was no difference in aRR of revision due to aseptic loosening.

Conclusions: The risk of revision was increased by 4% in CoP compared to MoP THAs at 20 years but no difference was found for CoXLP compared to MoXLP at 12 years. Our study did not demonstrate any advantage of ceramic heads over metal heads in the medium- to long-term follow-up. A limitation is that the NARA database does not contain any information on type of ceramic material.