

Diabetes Mellitus Type One Poses Greater Risk for Periprosthetic Joint Infection than Type Two for Patients Undergoing Total Joint Arthroplasty

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Introduction: The effect of diabetes on the risk of periprosthetic joint infection (PJI) is not well documented. We hypothesized that diabetes mellitus type 1 (DM1) patients would be at greater risk for PJI than those with diabetes mellitus type 2 (DM2) and that a history of diabetic complications would be associated with an increased risk for PJI.

Methods: We performed a retrospective cohort study on all adult patients that underwent hip or knee arthroplasty, with =2-years follow-up, within a state-wide database from 1996-2013. Of the 75,478 patients included, 1,668 had DM1 and 18,186 had DM2. There was no difference in age or sex between groups ($p>0.05$). Risk factors were calculated using Cox regression, adjusting for siblings and stratified by age. Logistic regression was used to analyze the effect of diabetic complications on risk of PJI, controlling for other known risks for PJI.

Results: The frequency of PJI in non-diabetic patients was 2.6% compared to 4.3% in all diabetics (RR 1.47, $p<0.001$). The patients with DM1 were at 1.8 times greater risk for PJI than DM2 (7% vs 4%, $p<0.001$). The following diabetic complications increased the risk of PJI: peripheral circulatory disorders (OR 2.59), ketoacidosis (OR 2.52), neurologic (OR 2.33), renal (OR 2.15), and ophthalmic (OR 1.76) (all $p<0.002$). The odds of PJI increased with each added complication (all, $p<0.001$) and patients with 4 or more complications were 9 times more likely to have PJI than uncomplicated diabetics. Overweight and obese DM2 patients were at greater risk for PJI whereas underweight DM1 patients were at greater risk (all $p<0.05$).

Conclusions: Our data showed an increased risk of PJI in DM1 patients compared with DM2, along with increasing risk for additional diabetic complications. These findings emphasize the need to better understand our diabetic patients' medical histories for more appropriate risk management.