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ABSTRACT TEMPLATE

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TITLE: The risk of myocardial infarction and venous thromboembolism after partial or total knee arthroplasty: a self controlled case series

BACKGROUND

Prior studies comparing patients undergoing knee replacement (KR) with non-KR controls have described a short-term increased risk of post-operative myocardial infarction (MI) and venous thromboembolism (VTE). Residual confounding could bias these findings. Despite seldom use in surgical epidemiology, self-controlled case series (SCCS) controls for time-fixed within-person confounding by design and can therefore be used to quantify any excess risk associated with knee replacement.

OBJECTIVES

To estimate the increase in risk of MI and VTE in the 3 months (91 days) after two types of KR: partial KR (PKR) and total KR (TKR).

METHODS

Data from two UK databases (National Joint Registry and Hospital Episode Statistics) were linked to identify KR and outcomes. Adults (18+) undergoing KR who experienced a) MI and b) VTE within 1 year either side of first KR were identified for the SCCS cohorts. Six months wash-outs were required for a new outcome of the same type to be considered a new event. Incidence rate ratios (IRR) and 95% confidence intervals (CI) were calculated for up to 3 months post-surgery compared to the 6-12 months prior to and 3-12 month post surgery together (reference period). A 6-month pre-exposure period was included prior to surgery date. Interactions with gender, ASA stage and TKR v PKR were assessed using a cut-off p-value <0.1. The assumptions of SCCS were assessed in sensitivity analyses: 1) assessing the risk for the first adverse event only, and 2) excluding patients who died within the 3 months post-KR.

RESULTS

Of 354,494 patient undergoing KR, 6,947 had 7,207 MIs and 4,227 had 4,284 VTEs. Patients who had an MI were on average 73 years old, with 61% male. 64% were ASA 1 or 2 and 5% had a partial KR. Patients who had a VTE were on average 72 years old, with 43% male. 78% were ASA 1 or 2 and 3% had a partial KR. In the 3 months post KR, IRR were 1.22 (95% CI 1.15, 1.30) and 9.26 (8.68, 9.89) for MI and VTE respectively. Interactions were identified for gender and ASA stage with the pre-exposure period only. Patients undergoing PKR were not at increased risk of MI in the 3 months after surgery, IRR 0.74 (0.53, 1.02), and at a lower increased risk of VTE than patients undergoing TKR (5.51 [3.87, 7.84] vs 9.43 [8.82, 10.08]). The assumptions of SCCS held with little change in the no death and first event models.

CONCLUSIONS

Patients are at a 20% and 9-fold increased risk of MI and VTE respectively in the 3 months post KR surgery compared to the reference period. No strong interaction was seen with gender or ASA stage, but patients undergoing PKR were not at excess risk of MI and at lower risk of VTE.