

Diabetes Mellitus Is A Risk Factor For Infection-related Revision In Knee But Not In Hip Arthroplasty



Michelle M.J. Jacobs¹, Inge Hommel², Petra J.C. Heesterbeek³

¹Department of Orthopaedic Surgery, Sint Maartenskliniek, Nijmegen, the Netherlands. Contact: mmjjacobs2@gmail.com;
²Department of Internal Medicine, Sint Maartenskliniek; ³Department of Research, Sint Maartenskliniek.

Introduction

Patients with diabetes mellitus (DM) are at increased risk of postoperative infections and all-cause revision after total joint arthroplasty. The association between DM and infection-related revision has not been well established.

Aims

1. To investigate the association between DM and the risk of hip (rTHA) or knee (rTKA) revision arthroplasty due to infection.
2. To explore perioperative glycaemic control in DM patients admitted for revision surgery.

Methods

Data collection

- Four databases were combined: a national revision arthroplasty database (2014-2024), and hospital's databases on DM diagnoses, PJI diagnoses (MSIS criteria) and perioperative glucose measurements.

Baseline data

- 2,143 rTHA and 2,928 rTKA patients, 576 (12,8%) had DM.
- Infection as revision indication: 356 rTHA (16.6%) and 292 rTKA (10.0%) patients.

Glucose data

- Last preoperative, mean postoperative day 0 (POD+0) and mean postoperative day 1 (POD+1) values.
- Hyperglycaemia: glucose >10 mmol/l; >180 mg/dl.

Statistics

- Multivariable logistic regression of potential risk factors for infection-related revision.
- Changes in perioperative glucose levels over time were analysed using repeated-measures ANOVA.

Results

1. DM as risk factor for infection-related revision

DM was associated with infection-related revision in rTKA, with an OR of 1.19 (95% CI 1.01-1.40), $P=0.041$ (Table 1). No significant association was seen in rTHA (OR=1.22; $P=0.300$).

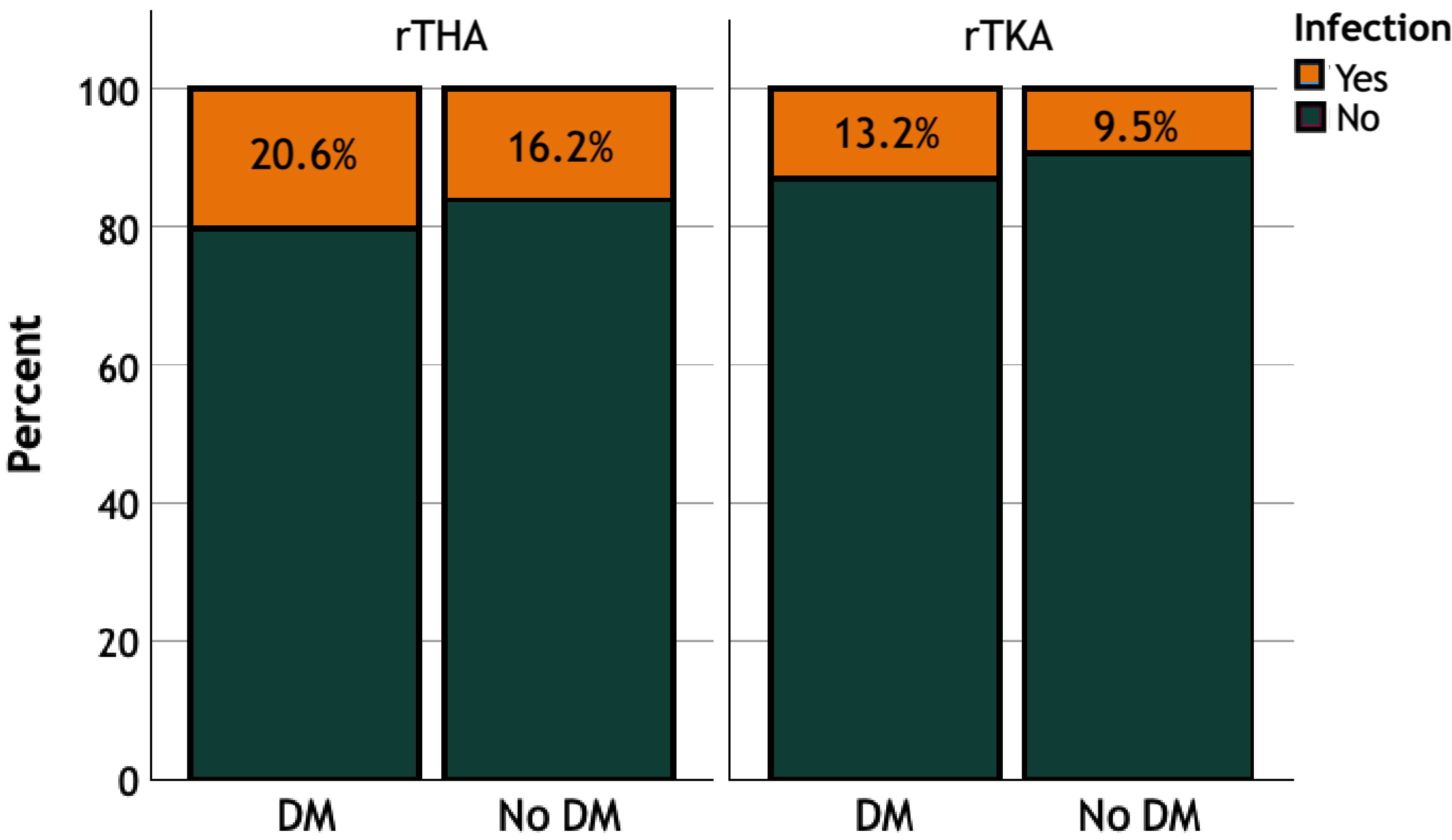


Figure 1. Stacked bar graphs showing the proportion of patients with infection as revision indication according to DM status.

2. Perioperative glycaemic control

The incidence of hyperglycaemia was high. Hyperglycaemia incidence increased from 20.3% preoperatively to 70.6% on POD+0, decreasing to 40.0% on POD+1.

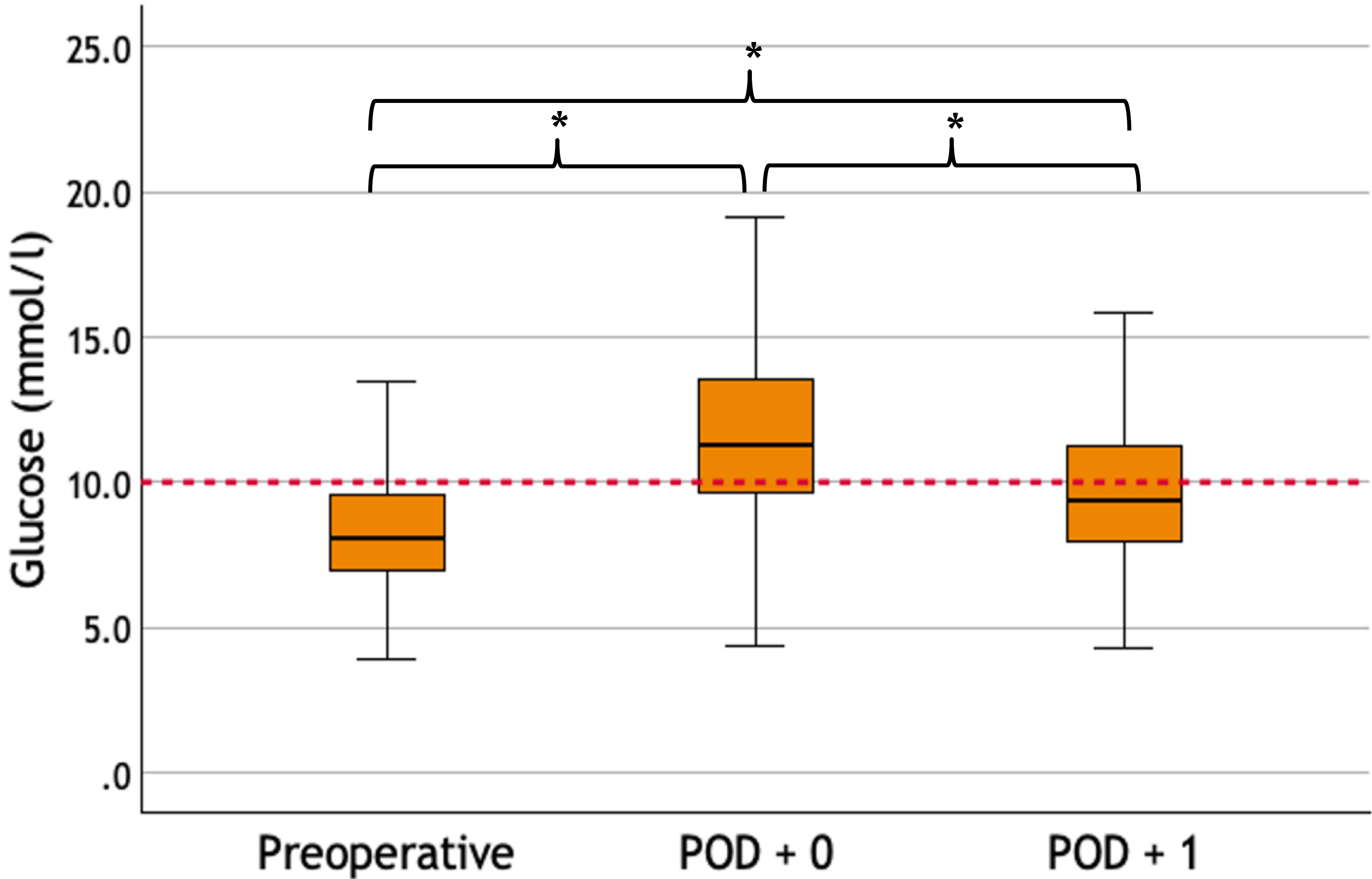


Figure 2. Tukey boxplots of glucose measurements at different timepoints in DM patients (N=576). Data is displayed as median $\pm$ IQR. The red dotted reference line at 10 mmol/l indicates the cut-off for hyperglycaemia. $P \leq 0.05$ (repeated-measures ANOVA).

Table 1. Multivariable logistic regression results.

Risk factor	OR	95% CI	P-value
rTHA			
DM	1.217	0.837-1.597	0.300
BMI	0.979	0.956-1.002	0.071
Age	1.007	0.997-1.017	0.167
Sex (men)	2.019	1.601-2.544	<0.001
rTKA			
DM	1.188	1.007-1.400	0.041
Sex (men)	1.486	1.164-1.896	0.001

OR, odds ratio; CI, confidence interval

Conclusions

- DM is associated with infection-related revision in rTKA, not in rTHA.
- Postoperative hyperglycaemia was common in DM patients.
- Future work should identify poorly controlled DM and investigate whether DM treatment optimisation reduces infection risk.