

Differences in outcome between Maori and Caucasian patients undergoing total joint arthroplasty for osteoarthritis

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ABSTRACT

Purpose. To compare differences in outcome between Maori and Caucasian patients undergoing total joint arthroplasty for osteoarthritis.

Methods. 45 men and 45 women aged 43 to 87 years who underwent total hip (n=54) or total knee (n=36) arthroplasties by a single surgeon and were followed up for at least one year were prospectively studied. Patients were classified according to American Society of Anesthesiologists (ASA) score. Preoperative comorbidity, length of hospital stay, postoperative complications, and pre- and post-operative outcomes in the 2 groups were compared.

Results. Maori patients were more likely than Caucasian patients to be obese (body mass index of >30 kg/m²) [37% vs. 15%], diabetic (15% vs. 5%), and smokers (32% vs. 13%). Postoperative complication rates and the lengths of hospital stay in the 2 groups were not significantly different. The ASA score correlated positively with the length of hospital stay; higher ASA scores predicted more prolonged

recovery.

Conclusion. Maori patients were more likely than Caucasian patients to have preoperative comorbidities, but their postoperative length of hospital stay and complication rates were not significantly different.

Key words: arthroplasty, replacement, hip; arthroplasty, replacement, knee; ethnic groups

INTRODUCTION

Total hip arthroplasty (THA) and total knee arthroplasty (TKA) are effective treatments for advanced osteoarthritis (OA) not responding to non-operative methods.¹ These interventions reduce pain and increase mobility, but may cause complications, including bleeding, thromboembolic events, infection, peri-prosthetic fracture, dislocation, nerve damage, and aseptic loosening.^{2,3}

In a study of early failure of THAs implanted at distant hospitals (in order to reduce waiting lists),⁴ 12 (44%) of 27 procedures entailed revision surgery at a mean follow-up of 6.5 years, compared to a failure

rate of 4.9% in those performed in local hospitals. The causes for such a difference in outcomes included surgical technique, implant selection and absence of follow-up. Therefore, operations should be performed by fully accountable surgeons in local hospitals.

Ethnic differences may also affect outcome. Differences between Maori and Caucasian patients with respect to medical comorbidities have been reported. They include smoking, alcohol consumption, obesity, diabetes, gout and cardiac problems; all are more prevalent in Maori patients.⁵ 47% of the inhabitants in Gisborne are Maori. We therefore compared outcome differences between Maori and Caucasian patients undergoing total joint arthroplasty (TJA) for OA.

MATERIALS AND METHODS

Between February 2007 and July 2008, 100 consecutive patients with symptomatic OA of the knee, hip or both were prospectively studied. The ethics board of the hospital approved the study, and informed consent was obtained from each patient. Patients undergoing TJA for reasons other than OA (femoral neck fractures, secondary malignancy or revision joint replacements) were excluded.

Of the 100 patients, 4 did not undergo TJA owing to high medical risks, 3 were not followed up adequately, and 3 failed to answer the questionnaire. The remaining 45 men and 45 women aged 43 to 87 years underwent 54 THAs and 36 TKAs by a single surgeon and were followed up for at least one year.

Patients were classified according to American Society of Anesthesiologists (ASA) score⁶ to identify those likely to be admitted to the postoperative high dependency unit.^{7,8} 40 of them were considered medically fit and did not undergo any anaesthetic assessment; the remaining 50 underwent pre-admission anaesthetic review to assess pre-existing medical comorbidities.

THA was performed through a direct lateral approach. Uncemented prostheses of the Pinnacle-Corail involving poly-on-metal or metal-on-metal were most commonly used, followed by the cemented prostheses of Spectran and Exeter with reflexion cup. TKR was performed through a midline approach with the patella not everted in 50% of patients. The posterior cruciate-retaining cemented knee prosthesis was used.

Preoperative comorbidity, length of hospital stay, early (3-month) postoperative complications and outcomes were assessed by an independent assessor. Pre- and post-operative scores for the short form Western Ontario and McMaster Universities Arthritis

Index (WOMAC) questionnaire were compared. The short form WOMAC consists of 12 questions to assess pain, function and stiffness, with 0 indicating severe limitation and pain and 100 indicating no pain and full function. It is a valid, sensitive and reliable alternative to the traditional WOMAC.^{9,10}

RESULTS

The mean ages of the Maori (n=38) and Caucasian (n=52) patients were 65 and 68 years, respectively. The 2 groups were comparable with respect to age, sex, and ASA scores (Table 1). However, Maori patients were more likely than Caucasian patients to be obese (body mass index of >30 kg/m²) [37% vs. 15%], diabetic (15% vs. 5%), and smokers (32% vs. 13%). These differences were consistent with findings from other studies.^{5,10} Medical comorbidities were evaluated preoperatively; hypertension was noted

Table 1
Patient demographics and outcomes

Demographics	Maori (n=38)	Caucasian (n=52)
Mean (range) age (years)	65 (43–82)	68 (45–87)
No. of males:females	19:19	26:26
No. of total hip arthroplasty	22	32
No. of total knee arthroplasty	16	20
Preoperative comorbidity		
Cardiac problem	13	19
Hypertension	22	26
Respiratory problem	8	8
Diabetes	7	3
Smokers (%)	32	13
Diabetics (%)	15	5
Body mass index of >30 kg/m ² (%)	37	15
American Society of Anesthesiologists score (no. of patients)		
I	13	21
II	21	25
III	4	6
IV	0	0
No. of complications		
Superficial infection	1	2
Deep infection	1	0
Wound ooze	5	2
Haematoma	0	4
Thromboembolic event	1	1
Nerve damage	0	0
Dislocation	0	0
Revision surgery	0	0
Intra-operative fracture	0	1
Aseptic loosening	0	0
Death	0	0
Mean (range) length of hospital stay (days)	7.4 (4–15)	7.2 (4–14)

Table 2
The length of hospital stay versus the American Society of Anesthesiologists score

American Society of Anesthesiologists score	Mean (range) length of hospital stay (days)
I	6.0 (4–9)
II	7.8 (5–15)
III	9.3 (6–14)

in 49 patients and cardiac problems in 36. Maori patients were less likely than Caucasian patients to have family members or friends who had TJA, or to report a good understanding of TJA as a form of treatment.

The mean waiting time from the orthopaedic clinic to the anaesthetic clinic was 1.4 months. Four patients had a delay exceeding 6 months (not counted as waiting time), owing to cardiac investigation. The mean waiting time from the orthopaedic clinic to surgery was 2.8 (range, 0.5–7) months.

Peri- and post-operative complication rates and the length of hospital stay were not significantly different in the 2 groups (Table 1). The ASA score correlated positively with the length of hospital stay; higher ASA scores predicted more prolonged recovery (Table 2). For example, patients with ASA I

stayed in hospital for a mean of 6.0 days, compared to 9.3 days for patients with ASA III. These findings are consistent with those from other studies.^{6,7,11} The mean pre- and post-operative scores for the short form WOMAC were 43 (range, 30–56) and 81 (range, 74–90), with questionnaire response rates of 84% and 60%, respectively. They were not significantly different in the 2 groups.

DISCUSSION

Patients with diabetes mellitus have higher postoperative rehabilitation requirements.¹² Preoperative assessment has a major role in lowering postoperative medical complications; 32% of those evaluated for TJA were deemed to have benefited from its findings.¹² This may explain the equivocal outcomes with respect to ethnicity in our study.

Longer waits for THA incur greater economic costs and deterioration in physical function while waiting.¹³ In New Zealand, 30% of THA patients had waited for care for 6 months or more and 6% had waited 24 months or more. In our series, the mean waiting time from presentation in the orthopaedic clinic to surgery was 2.8 months, which is probably due to the Government Joint Initiative Scheme. Nonetheless, the efficiency of the waiting-list coordinator and hospital staff was equally important.

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