



## Hospital stay and early complication rates following joint replacement: is there any ethnic difference in New Zealand?

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### Abstract

It is clear that there is no benefit in considering the ethnic origin of a patient when preparing for surgery. Instead, each patient should be considered in turn, taking their comorbidities, lifestyle, and ASA score into account. Thorough preoperative assessment is vital to enable recognition and treatment of any pre-existing medical conditions thus ensuring optimal fitness of the patient prior to surgery. It is also of financial and medical benefit to minimise waiting time prior to surgery.

Osteoarthritis is a degenerative condition of the joints. The joints most commonly involved are the hip; knee; and distal interphalangeal, proximal interphalangeal, and carpometacarpal joints in the hand. Its prevalence and severity increase with age.

Total joint replacement (TJR) has been widely used for the treatment of advanced osteoarthritis which has not responded well to nonoperative methods.<sup>1</sup> The most commonly seen of these are total hip replacement (THR) and total knee replacement (TKR). The operations are effective (reducing pain and increasing mobility) but are not without complications.<sup>2</sup> As well as general surgical complications (bleeding, thromboembolic events, infection), there is a risk of periprosthetic fracture, dislocation (in THR), nerve damage, and aseptic loosening.<sup>3</sup>

Factors effecting complication rates have been investigated at length and include surgical technique, implant selection, and absence of follow-up.<sup>4</sup> One other factor that could affect outcome, but not yet investigated, is ethnic difference.

Gisborne has a high Māori population (47%) as compared to rest of New Zealand and is therefore an ideal place to compare Māori to Caucasians (European New Zealanders). There are definite differences with respect to medical comorbidities between the two populations, with smoking, alcohol consumption, obesity, diabetes, gout, and cardiac problems being particularly prevalent in Māori patients.<sup>5</sup>

A prospective study was carried out at Gisborne Hospital by a single surgeon [VSP] to ascertain whether there is any difference between these two populations. This study is to document any difference exist between Māori and Caucasians with respect to postoperative hospital stay and early complication rates.

### Materials and Methods

Of the 100 consecutive patients, 10 were not included in the study (4 did not undergo operation due to high medical risk, 3 were not adequately followed up, and 3 failed to answer the questionnaire). The remaining 90 received THR (n=54) or TKR (n=36).

All patients were grouped under ASA classification<sup>6</sup> to help recognise those requiring postoperative high dependency unit admission.<sup>7,8</sup> Fifty patients required a preadmission anaesthetic review to assess pre-existing medical comorbidities, while the remaining 40 were considered medically fit for surgery.

Age range was 43 to 87 years (mean: 64.9 years for Māori and 67.8 years for Caucasians). Fifty percent were women (n=45). Fifty-two participants (58%) were Caucasian and 38 (42%) were Māori. The two populations were comparable with respect to age, sex, and clinical indication for THR and TKR (Table 1), and showed little difference in ASA scores (Table 2). However, Māori patients were more likely to be obese (37% had BMI>30), more likely to be diabetic (15%), and more likely to be smokers (32%).

**Table 1. Demographics of patients**

Variables	Māori (n=38)	Caucasian (n=52)	All patients (N=90)
Age range (years)	43–82	45–87	43–87
Mean age (years)	64.9	67.8	66.56
Gender ratio (M:F)	19:19	26:26	45:45
Smokers (%)	32.4	13.4	21.1
Diabetics (%)	15	5	10
BMI >30 (%)	36.8	15.4	24.4

**Table 2. ASA\* scores**

ASA score	Māori	Caucasian	All patients
I	13	21	34
II	21	25	46
III	4	6	10
IV	0	0	0

\*American Society of Anesthesiologists

The surgeon observed that Māori patients were less likely than Caucasian patients to have family or friends who had received joint replacement or to have a good understanding of joint replacement as a form of treatment.

Following the procedure, all early complications (3 months postoperative) were obtained from clinical notes by an independent assessor. In addition, length of postoperative hospital stay was noted.

## Results

Perioperative and postoperative complication rates showed no significant difference between the two populations, relative to the population sizes (Table 3). Similarly, the postoperative hospital stay was comparable in both populations, with Māori patients staying slightly longer on average (Table 4). The trend seen with hospital stay and ASA scores showed a positive correlation as expected, with higher ASA score predicting longer recovery periods (Table 4).

**Table 3. Complications**

Complications		Māori	Caucasian	All patients
Infection	Superficial	1	2	3
	Deep	1	0	1
Bleeding	Wound ooze	5	2	7
	Haematoma	0	4	4
Thromboembolic		1 DVT	1 DVT and PE	2
Nerve damage		0	0	0
Dislocation		0	0	0
Revision joint		0	0	0
Intra-op[erative] fracture		0	1	1
Aseptic loosening		0	0	0
Death		0	0	0

DVT=deep vein thrombosis; PE=pulmonary embolism.

**Table 4. Postoperative hospital stay**

Variables	Mean (days)	Range (days)
Māori	7.42	4–15
Caucasian	7.22	4–14
ASA I	6.0	4–9
ASA II	7.8	5–15
ASA III	9.3	6–14

The mean time from orthopaedic clinic to the anaesthetic clinic was 1.38 months. Four patients had a 6–7 month delay due to sophisticated cardiac investigation (not included in mean wait time). The mean time from the orthopaedic clinic to the date of surgery was 2.81 months (range: 15 days to 7 months).

## Discussion

Despite notable differences in pre-assessment findings of comorbidities and lifestyle among Māori and Caucasians,<sup>9</sup> hospital stay and complication rates were similar in both populations. Research suggests that patients with diabetes mellitus have higher postoperative requirements for rehabilitation,<sup>9,10</sup> therefore, it might be expected (due to higher prevalence) that hospital stay in Māori patients would be higher. This study did not produce conclusive data on this matter.

It has been noted that complication rates are particularly low in this series. We feel that preoperative assessment has a major role in lowering postoperative medical complications. Clelland<sup>10</sup> found that 32% of patients evaluated for TJR benefited from findings on the preoperative medical evaluation. This thorough preoperative assessment may also explain the equivocal outcome with respect to ethnicity seen in this study.

Fielden et al<sup>11</sup> found that longer waits for THR incur greater economic costs and deterioration in physical function while waiting. In New Zealand, 30% had been waiting for 6 months or more for care and 6% had been waiting for 24 months or more. Our series, no patient waited more than 4 months and the average wait from

orthopaedic clinic to surgery was 2.81 months (range 15 days to 7 months). This is probably due to the “Government Joint Initiative Scheme”, but we feel that the efficiency of the waiting list co-ordinator as well as hospital staff involved in this work is equally important.

Although our investigation suggested no difference between Māori and Caucasian patients with regards to hospital stay, there was good correlation between length of stay and ASA score. Patients with ASA I stayed an average of 6.0 days compared to 9.3 days for patients with ASA III. These findings were in line with those previously documented.<sup>6,7</sup>

**Competing interests:** None known.

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