



Original research

Antibiotic prophylaxis for dental treatment after prosthetic joint replacement: exploring the orthopaedic surgeon's opinion

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ABSTRACT

Background: Antibiotic prophylaxis before dental treatment is routinely recommended by orthopaedic surgeons to prevent prosthetic joint infection (PJI). This recommendation is at odds with current guidelines.

Methods: A postal survey of 9 checkbox or short-answer questions was completed by 633 orthopaedic surgeons.

Results: The majority of respondents ($n = 186$ of 260, 72%) believe that antibiotic prophylaxis is required indefinitely for dental treatment. A small number ($n = 43$, 15%) seek a dentist's opinion before elective joint replacement. The surgeons reported low numbers of PJIs, although 24% ($n = 68$ of 280) believed that they were associated with dental treatment.

Conclusions: Australian orthopaedic surgeons continue to recommend antibiotic prophylaxis for dental treatment. The recording of PJI in relation to dental procedures into clinical registries would enable the development of consistent guidelines between professional groups responsible for the care of this patient group.

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Introduction

Prosthetic joint infection (PJI) is associated with significant morbidity, functional decline, potential implant failure, and mortality; therefore, measures to prevent its occurrence are important [1,2]. The majority of PJIs occur after intraoperative contamination from airborne pathogens or microorganisms present on the patient's skin. Late PJIs, 1–2 years after surgery, are often due to bacterial seeding via the hematogenous route, from the oropharynx, gastrointestinal, or genitourinary tract [3,4].

Antibiotic prophylaxis before dental treatment is used to prevent late PJI infection that could occur after invasive dental

treatment. There are risks associated with antibiotic prophylaxis including the potential for an increase in the number of adverse reactions, including antibiotic sensitivity and anaphylaxis, as well as increasing the prevalence of multidrug-resistant bacterial infections [5–7].

There is limited evidence demonstrating an association between dental treatment and PJI [1]. Case reports and retrospective studies that suggest a relationship between dental treatment and PJI are usually cited as justification for continuing to use antibiotic prophylaxis [8–11]. Current international guidelines do not support the use of antibiotic prophylaxis to prevent PJI [7,12–15]. The Australian Therapeutic Guidelines recommend reducing the risk of infection by comprehensive medical management perioperatively [15]. Despite these recommendations, some dental and orthopaedic surgeons continue to prescribe antibiotic prophylaxis hoping to protect patients from the dire consequences of PJI [16,17].

The aims of this survey were to (1) measure the practice of Australian orthopaedic surgeons on the need for, and use of, antibiotic prophylaxis before dental treatment for patients with

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prosthetic joint replacements, (2) investigate whether orthopaedic surgeons recommend a dental assessment before surgery, and (3) identify how long they recommend patients wait before attending the dentist after their joint replacement.

Material and methods

There were 1210 orthopaedic surgeons registered with the Australian Health Practitioner Regulation Agency (AHPRA) according to the 30th June 2012 annual report [18]. We initially planned to survey the entire orthopaedic surgeon population because of evidence of a poor response rate in similar studies which indicated difficulty encouraging participation [16,17,19]. However, a comprehensive list of surgeon names and addresses was not made available by either AHPRA or the professional association representing orthopaedic surgeons. Without comprehensive mailing lists, it was not possible to survey all surgeons. The study sample was therefore determined by surveying all surgeons in the smaller states and territories—Tasmania, Australian Capital Territory, the Northern Territory—and half the number of surgeons in the larger States—New South Wales, Queensland, South Australia, Victoria, and Western Australia. In total, 633 surgeons were identified, just over half of all orthopaedic surgeons registered in Australia (Table 1).

Internet searches of the Royal Australian College of Surgeons and Health Engine websites were used to gather potential participant names and addresses [20,21]. If letters were returned to sender because of an incorrect address, further online searches of the AHPRA and Yellow Pages websites were conducted to obtain the correct or updated contact details [22,23].

The survey was developed by a multidisciplinary dental and medical team (the authors) and did not include an orthopaedic surgeon. A mixed-mode approach was adopted, with surgeons given the option to access the survey online or complete and return a hard copy. There were 9 short-answer or checkbox questions that complied with the requirements of SurveyMonkey, the free online survey tool used (Table 2) [24]. Based on available literature, the questions assumed that surgeons recommended antibiotic prophylaxis for dental procedures that were likely to induce a bacteraemia [2,16].

The hard copy questionnaire consisted of one double-sided A4 sheet of paper. Unique identification numbers were hand written on each survey, and each covering letter was personally signed. The survey was posted to surgeons and a follow-up reminder was mailed 4 weeks later. Data collection occurred between October 2013 and January 2014.

Ethics approval was obtained from the Human Research Ethics Committee (HREC; The Queen Elizabeth Hospital/Lyell McEwin

Table 2

The survey questions and response options.

| | |
|---|---|
| 1. Gender | <input type="checkbox"/> Male |
| | <input type="checkbox"/> Female |
| 2. How many years have you been practicing as an orthopaedic surgeon? | Enter number |
| 3. How many prosthetic hip replacements do you perform each year? | <input type="checkbox"/> 1-10 |
| | <input type="checkbox"/> 11-20 |
| | <input type="checkbox"/> 21-30 |
| | <input type="checkbox"/> 30+ |
| 4. What percentage of your patients have developed a prosthetic joint infection (please consider any joint not just hip)? | <input type="checkbox"/> Early - % |
| | <input type="checkbox"/> Delayed - % |
| | <input type="checkbox"/> Late - % |
| 5. Do you refer patients to a dentist prior to an elective prosthetic joint replacement? | <input type="checkbox"/> No |
| | <input type="checkbox"/> Yes |
| 6. How long after the joint replacement surgery do you recommend your patients wait before seeking dental treatment? | <input type="checkbox"/> <3 months |
| | <input type="checkbox"/> 3-6 months |
| | <input type="checkbox"/> 6-12 months |
| | <input type="checkbox"/> >12 months |
| | <input type="checkbox"/> Other - Describe |
| 7. In your opinion do patients with a prosthetic joint require antibiotic prophylaxis prior to dental treatment? | <input type="checkbox"/> No |
| | <input type="checkbox"/> Yes |
| 8. In your opinion, for how long after the joint replacement surgery is antibiotic prophylaxis required for dental treatment? | <input type="checkbox"/> 3 months |
| | <input type="checkbox"/> 6 months |
| | <input type="checkbox"/> 12 months |
| | <input type="checkbox"/> Indefinitely |
| 9. Do you believe that any PJs developed by your patients were the result of dental treatment? | <input type="checkbox"/> No |
| | <input type="checkbox"/> Yes |
| | If yes how many - % |

Hospital/Modbury Hospital (TQEH/LMH/MH); HREC reference number: HREC/13/TQEHLMH/55). The study was funded by Aged and Extended Care Services at the Queen Elizabeth Hospital. No external funding was used. Descriptive results are presented; analysis was performed using SPSS, version 21.0 [25].

Results

Of the 633 surgeons approached, 314 (49.6%) usable surveys were returned and analyzed (Table 1). Sixty-two (9.8%) surgeons advised that they do not perform joint replacements and were excluded from the analysis. One-third (n = 238, 37.6%) did not complete or return the survey or were no longer at the practice address. Of the 314 returned surveys, only 11 (0.04%) surgeons completed the online version.

The majority (n = 297, 96.7%) of respondents were male and had been practicing as orthopaedic surgeons from 1 to 43 years, with 33.9% (n = 105) being in practice between 11 and 20 years. Seventy-two (23.2%) had been in practice <5 years. Two-thirds (n = 190, 67.1%) of the respondents perform >30 joint replacements each year.

Surgeons reported that <2% of their patients experienced a joint infection at any stage after the replacement. One-quarter of the surgeons who responded to this question (n = 68 of 280, 24.3%) believed that PJs had resulted from dental treatment.

Most respondents (n = 186 of 260, 71.5%) believe that antibiotic prophylaxis is required indefinitely for dental treatment. Some

Table 1

The number of registered orthopaedic surgeons and survey response rate by state and territory, n (%).

| State | Registered | Sampled | Returned usable surveys |
|-------|--------------|------------|-------------------------|
| ACT | 25 (2.1) | 23 (92.0) | 12 (52.2) |
| NSW | 396 (32.7) | 202 (51.0) | 100 (49.5) |
| NT | 7 (0.6) | 4 (5.7) | 1 (25.0) |
| QLD | 260 (21.8) | 129 (49.8) | 64 (49.6) |
| SA | 111 (9.2) | 56 (50.5) | 30 (53.6) |
| TAS | 21 (1.7) | 20 (95.2) | 11 (55.0) |
| VIC | 278 (23.0) | 138 (49.6) | 66 (47.8) |
| WA | 112 (9.3) | 61 (54.5) | 30 (49.1) |
| Total | 1210 (100.0) | 633 (52.3) | 314 (49.6) |

ACT, Australian Capital Territory; NT, Northern Territory; NSW, New South Wales; QLD, Queensland; SA, South Australia; TAS, Tasmania; VIC, Victoria; WA, Western Australia.

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