

## Antibiotic prophylaxis after total joint replacement

*To the Editor*—In a recent edition of this journal, Kuong et al<sup>1</sup> advocated adherence to the new American Association of Orthopaedic Surgeons recommendations that all patients irrespective of underlying medical conditions, or length of time a prosthetic joint has been in place, require prophylactic antibiotic coverage when having invasive dental treatment. The authors in their review of the literature noted that 6 to 11% of all cases of infected prosthetic joints are attributable to dental procedures and then noted that the offending microorganisms were mainly viridians streptococci, *Gemella* spp, *Peptostreptococcus* spp, *Neisseria* spp, *Actinomyces* spp, *Prevotella* spp, and other anaerobes.

This construct unfortunately does not take into account that staphylococci from the oral cavity also contribute to late joint infections. Staphylococci may initially arise from the skin, nasal tract, or gastrointestinal tract, but they then often migrate and transiently reside in the oral cavity with adherence mechanisms permitting a portion of them to be retained in the periodontal pocket. Furthermore, because of micro-ulceration of the gingival sulcular and pocket lining epithelium and proximity to the bloodstream, staphylococcal bacteraemias are quite possible as is the resultant staphylococcal infection of a prosthetic joint. Specifically, older ( $\geq 70$  years), healthy, non-denture-wearing individuals have been shown to have a higher isolation frequency ( $P < 0.05$ ) and a higher proportion ( $P = 0.056$ ) with staphylococci in their unstimulated whole saliva than younger persons.<sup>2</sup> The wearing of partial dentures increases the proportion of staphylococci in the saliva of older individuals.<sup>3</sup> Among individuals (mean age, 59 years) with rheumatoid arthritis (RA) and concomitant xerostomia who require long-term

immunosuppressive steroid therapy, there is also a high prevalence with *Staphylococcus aureus* on the tongue and in the oropharynx.<sup>4</sup> Thus, the elderly and those with RA—the two groups of individuals who very frequently require joint replacement—often harbour staphylococci in their oral cavity.

Furthermore, in individuals with signs of chronic or acute dental infections, the presence of staphylococcal species is even more significant. Specifically, young (age range, 32-59; mean, 45 years) healthy individuals with periodontitis evidence, harbour both *S aureus* and *Staphylococcus epidermidis* in their subgingival sulci.<sup>5</sup> Studies using molecular technology indicate that the virulence factors ( $F_{\text{gBP}}$  genes) associated with *S aureus* and *S epidermidis* are present in some aseptically opened pulp chambers of non-vital teeth having neither coronal leakage around restoration margins nor sinus tracts.<sup>6</sup> The above noted citations lead me to conclude that the research results cited by Kuong et al<sup>1</sup> to define oral/dental flora possibly involving prosthetic joint infections were too restrictive. The information that I have cited from the literature further supports Kuong et al's contention that patients with prosthetic joints having invasive dental treatment require prophylactic antibiotic coverage.

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## Authors' reply

*To the Editor*—We thank Professor Friedlander for his further insight into the bacteriology of patients with dental conditions and the recognition that after joint replacement surgery, antibiotic cover is imperative for all patients. Indeed, over half of infected joint replacements are due to staphylococci, while streptococci fall a distant second causing only 6% of the infected cases.<sup>1</sup> The data quoted from our literature search suggesting that infected prostheses after invasive dental procedures are mainly due to viridans streptococci and other oral flora, come from blood cultures following dental work in general.<sup>2</sup> Elderly patients wearing dentures, rheumatoid arthritic patients on long-term immunosuppressive therapy, and patients with known periodontitis fall into the 'high-risk' category as advocated by the American Dental Association.<sup>3</sup> As suggested in our paper, extra caution should be exercised in

prescribing prophylactic antibiotics for this subset of patients. On the other hand, surgeons should not be lulled into a false sense of security in patients who are seemingly dentally 'fit' as it is also recognised that routine daily activities such as toothbrushing and even chewing may produce greater degrees of bacteraemia than dental procedures.<sup>2</sup> To reiterate our conclusion, clinical judgement tailor-made to each individual is paramount in safeguarding prosthetic joints in our patients.

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