

# Is there a need for antibiotic prophylaxis for some aspects of paediatric conservative dentistry?

*Intensity of bacteraemia associated with conservative dental procedures in children* G. J. Roberts, P. Gardner, P. Longhurst, A. E. Black, and V. S. Lucas *Br Dent J* 2000; 188: 95-98

## Objectives

To explore the individual dento-gingival manipulative procedures that together lead to the placement of a restoration and to estimate the associated intensity of bacteraemia.

## Patients and methods

Healthy children receiving dental treatment under general anaesthesia provided blood samples 30 seconds after one of four dento-gingival manipulative procedures: 1. Placement of rubber dam, 2. Use of the high speed drill, 3. Use of the slow speed drill, and 4. Placement of matrix band and wedge. Blood cultures were processed to give the percentage prevalence of bacteraemia, the intensity of organisms per millilitre of blood and the identity of the organisms cultured.

## Results

A total of 257 children were recruited to the study. The percentage positive prevalence of blood cultures was baseline – 9.3%, rubber dam placement — 31.4%, slow drill — 12.2%, fast drill — 4.3%, and matrix band and wedge — 32.1%. The intensity of bacteraemia was baseline — 1.2 cfu, rubber dam placement — 1,962 cfu, slow drill — 0.3 cfu, fast drill — 1.9 cfu, matrix band and wedge — 4.8 cfu.

## Conclusions

These data indicate that dento-gingival manipulative procedures comprising a simple dental restoration can lead to a bacteraemia

comparable to that from dental extractions. It is suggested that these data may indicate the need for antibiotic prophylaxis for some aspects of conservative dentistry.

## In brief

- Intensity of bacteraemia using lysis centrifugation has shown that there is a wide range of intensity of dental bacteraemia following conservative dental procedures.
- Most of the dental procedures have very low levels of intensity of the order of  $1 \times 10^1$ ,  $1 \times 10^2$ .
- Use of the high speed drill and use of the slow speed drill does not cause a bacteraemia higher than the baseline.
- Placement of rubber dam caused bacteraemia on 31% of occasions with an average intensity of 1,962 cfu/ml.
- Use of a matrix band and wedge caused a bacteraemia on 32% of occasions with an average intensity of 4.8 cfu/ml.
- These data raise questions about the appropriateness of current recommendations for antibiotic prophylaxis.

## Comment

This paper gives quantitative information on bacteraemia following conservative dental procedures and complements the previous work from this group on bacteraemia following minor oral surgery procedures in 1998.<sup>1</sup> It highlights current antibiotic prophylaxis guidelines in the USA, UK and internationally, and questions whether those guidelines are appropriate.

It is published at a time when there has been a lot of interest and discussion about such guidelines and adds significant knowledge to the literature with regard to the level of bacteraemia produced by different clinical procedures.

However, the authors remind us that bacteraemias are present most of the time as a result of normal chewing and the question that we would all like to know as clinicians is 'at what level does a bacteraemia become significant?' No ethical clinical trial could ever be conducted to give us the answer. The effectiveness of antibiotic prophylaxis to prevent endocarditis in humans has not

been proven and probably never will be.<sup>2</sup>

A recent case-control study of 273 adults has questioned whether antibiotic prophylaxis for endocarditis as currently practised is necessary at all<sup>3</sup> or whether only specific high risk groups should be targeted. Other published work has shown endocarditis to occur even when correct antibiotic prophylaxis was given<sup>4</sup> and microbiological studies have highlighted the emergence of resistant strains of viridan streptococci.<sup>5</sup>

It is now an appropriate time for the dental profession to work closely with colleagues in cardiology and microbiology to develop new guidelines that take into account current knowledge on endocarditis and oral microorganisms. These guidelines should aim to be brief and simple to avoid confusion.

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- 4 O'Sullivan J, Anderson J, Bain H. Infective endocarditis in children following dental extraction and appropriate antibiotic prophylaxis. *Br Dent J* 1996; 181: 64-65.
- 5 Doern G V, Ferraro M J, Brueggemann A B, Ruoff K L. Emergence of high rates of antimicrobial resistance among viridans group streptococci in the United States. *Antimicrob Agents Chemother* 1996; 40: 891-894.