

# Prevention of infective endocarditis before dental procedures

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A position statement released by The South African Dental Association.

Infective endocarditis (IE) is a rare but severe disease and occurs when circulating microorganisms colonise cardiac valves (both natural and prosthetic), the endocardium, or intra-cardiac devices.<sup>1</sup> Certain pre-existing conditions render an individual more susceptible. Because of the serious associated morbidity and mortality, prevention of IE is an important clinical issue.

In a three-year prospective epidemiological study of IE in the Western Cape, rheumatic heart disease (RHD) was the major predisposing condition in 77% of the patients. Seventeen percent had prosthetic heart valves.<sup>2</sup> IE may also occur as a result of invasive procedures or in the placement of prosthetic valves and implantable cardiac devices.<sup>1-3</sup> This is the predominant cause of IE in Europe/North America, where guidelines and indications for antibiotic prophylaxis have been reduced.

In the Western Cape study, six-month mortality was 36% (much higher than reported international rates of 6% to 27%), and nearly half of the patients required subsequent valve replacement. Cardiac failure developed or worsened in just over 75%, which may in part be related to late referral and other inefficiencies in local health care services.<sup>2</sup> A more recent publication in Gauteng reported an increasing incidence of right-sided endocarditis associated with the use of intravenous nyoape, in HIV infected individuals.<sup>4</sup>

As RHD markedly elevates the risk of IE, its prevention should be a priority, but unfortunately this has not yet happened, neither here nor in other developing countries.<sup>3</sup> Instead, antibiotic prophylaxis has been advocated to reduce bacterial adherence and minimise or prevent the bacteraemia that precedes endocarditis.<sup>5</sup> Unfortunately, its efficacy is controversial.<sup>2,5-12</sup>

In Europe, it has been estimated that prophylaxis may avoid only one case of IE per 150,000 dental procedures (in intermediate risk patients) and that only one case per 46,000 would occur for dental procedures unprotected by antibiotics.<sup>13</sup>

However, South Africa is not Europe, and the high incidence of RHD may require different protocols. Transient bacteraemia occurs not only following dental (and other) procedures, but also after routine oral activities such as tooth brushing, flossing and chewing. It is likely that there may be a cumulative effect of low-grade daily episodes, especially in those with poor oral hygiene, and that this may represent a greater risk factor than sporadic bacteraemia occurring with a single invasive / dental procedure. Patients with underlying heart conditions that predispose to bacterial colonisation are therefore exposed to a low but continual lifelong risk of developing IE.

A recent SA study concluded that inadequate attention is paid to the maintenance of oral hygiene in patients

with severe RHD requiring cardiac surgery<sup>14</sup> and there is no doubt that maintenance of optimal oral hygiene is the most effective intervention for the prevention of IE of oral origin.<sup>1-3,5-15</sup> However, the recommended regimens of regular professional dental care, the appropriate use of manual, powered, and ultrasonic toothbrushes, the use of dental floss and other plaque-removal devices, are beyond the reach of most South Africans.

Therefore the recommendations for antibiotic prophylaxis take all the above into account, and are as follows:

1. Patients with valvular heart disease should be referred to a dentist / oral hygienist for regular and ongoing monitoring, treatment and advice wherever possible. Clearly this responsibility rests with both the cardiologist and the dentist. It is recommended that patients receive a warning card to record their cardiac condition and any drug therapy, and the suggested prophylactic measures to be taken before dental treatment.
2. The following patients are considered to be at risk:
  - Patients with a history of rheumatic heart disease.
  - Patients with a prosthetic valve or prosthetic material used for cardiac repair.
  - Patients with previous IE.
  - Patients with congenital heart disease:
    - Cyanotic congenital heart disease without surgical repair or with residual defects, palliative shunts or conduits.
    - Congenital heart disease with complete repair with prosthetic material whether placed by surgery or percutaneous technique, up to 6-months after the procedure.
  - When a residual defect persists at the site of implantation of prosthetic material or device by cardiac surgery or percutaneous technique.
3. For the patients identified above, the following procedures are those requiring antibiotic prophylaxis:
  - Procedures requiring manipulation of the gingival or peri-apical region of the teeth or perforation of the oral mucosa, where bleeding is anticipated. In some situations, this may include intra-ligamental local anaesthetic infiltration and placement of orthodontic bands.
  - Periodontal and endodontic infections are mainly due to gram-negative bacteria. Merely covering these with Amoxicillin will not be effective, and broader therapy is required.

*Note: Antibiotic prophylaxis is not recommended for local anaesthetic injections in non-infected tissue, treatment of superficial caries, removal of sutures, dental X-rays, placement of removable prosthodontics or orthodontic appliances or braces or following shedding of deciduous teeth or trauma to the lips or oral mucosa. There appears to be no evidence to contraindicate implants in any patient at risk. The indication*

*should be discussed on a case-by-case basis, and the patient should be informed of the uncertainties and the need for close follow-up.*<sup>13</sup>

- The following are the recommended antibiotic prophylaxis regimens: Cephalosporins should not be used in those with anaphylaxis, angio-oedema or urticaria after Penicillin or Ampicillin.

| Situation               | Antibiotic               | Single dose 30-60 mins before procedure, I.O or I.V. |          |
|-------------------------|--------------------------|--|----------|
|                         |                          | Adults   | Children |
| Not penicillin allergic | Amoxicillin / Ampicillin | 2g   | 50mg/kg  |
| Allergy to penicillin   | Clindamycin              | 600mg  | 20mg/kg  |

*Alternatives:* Cephelaxin 2g i.v. for adults or 50mg/kg i.v. for children; Cefazolin or Ceftriaxone 1g i.v. for adults or 50mg/kg i.v. for children.

Clindamycin is not always available in a suspension form in certain State clinics. It is therefore suggested that suitable alternatives are azithromycin or clarithromycin, 500mg for adults and 15mg/kg in children.<sup>11</sup>

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#### COMMENT

As with all such policy statements, SADA would welcome feedback, and this statement will be formally reviewed every three years.

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The formulation of a policy for a controversial clinical dilemma demands the attention and commitment of experienced experts in the field. The vexed question of just when and how antibiotics may play a role in the prophylaxis of Infective Endocarditis is just such a challenge. The teams assembled to wrestle with the determination of a policy for South Africa combined their expertise to produce documents which offer guidelines which will be invaluable to all practitioners faced with patients who may.. or may not.. require prophylactic antibiotic cover. The accolades and appreciation of the South African Dental Association are accorded to the members of these committees.

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The JOINT COMMITTEE established to consider in depth the role of prophylactic antibiotic therapy in Oral and Dental practice.

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# Oral medicine case book 76: Methotrexate induced mucosal erosions and ulcerations

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A 71-year-old male was referred from his general practitioner to the Oral Medicine Clinic at the University of the Western Cape, Oral Health Centre, Tygerberg campus, on account of a six-week history of recurrent oral ulceration.

The patient reported that his mouth and throat were painful and he had difficulty in swallowing food. Initially, the ulcers had persisted over the two weeks following the prescription of Dynexan<sup>®</sup>, Augmentin 1g BDS for 5 days, Andolex C<sup>®</sup> and Mucaïn mouthwash<sup>®</sup>, by his general practitioner. Subsequent referral to an ENT surgeon had resulted in confirmation of an extra-oesophageal reflux component. A PPI (proton-pump inhibitor), Gastriwin<sup>®</sup>, was prescribed.

The patient disclosed that he had Type II diabetes, hypertension and had suffered a cerebrovascular accident (stroke) two years previously. Questioning by the ENT surgeon revealed that the patient had consulted a dermatologist who had prescribed methotrexate (MTX) to treat psoriasis. The patient did not use supplementary folic acid. The outcome of blood investigations, requested by the ENT surgeon, revealed bone marrow suppression as a result of the methotrexate usage. The patient was referred to his dermatologist with the recommendation that the medication be supplemented with folic acid.

Extra oral examination revealed the presence of a 10 mm scaly patch, surrounded by an erythematous margin, on the patient's right hand. Similar lesions were observed on the extensor surfaces of both legs.

The patient was edentulous with a loss of vertical dimension and did not wear any dentures. Diffuse, ill-defined erosions and ulcerations were present bilaterally on the buccal mucosa, upper and lower labial mucosa.

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## ACRONYMS

MTX: Methotrexate

The surfaces of the lesions were white to yellow in colour. The posterior soft palate had areas of irregular ulcerations and erosions, which contributed to the difficulty in swallowing.

A differential diagnosis of methotrexate-induced oral ulceration was proposed. The condition was exacerbated by the lack of folic acid supplementation, which contributed to the subsequent bone marrow suppression. The lymphocyte count, red cell count and platelet levels were 0.5x10E9/L, 2.8 x10E12/L and 63x10E9/L respectively (Table 1).

| Blood Investigation  | Result       | Normal Range      |
|----------------------|--------------|-------------------|
| Lymphocyte count     | 0.5 x10E9/L  | 1.00-4.00 x10E9/L |
| Red blood cell count | 2.8 x10E12/L | 4.5-5.9 x10E12/L  |
| Platelet levels      | 63 x10E9/L   | 140-420 x10E9/L   |
| Hemoglobin           | 7.9 g/dL     | 11.5-16 g/dL      |
| Hematocrit           | 0.25 L/L     | 0.40-0.50 L/L     |

## DISCUSSION

Oral ulceration is a common side effect of various drugs.<sup>1,2</sup> Direct contact may cause local hypersensitivity or chemical burn, or, less frequently, the complication is part of a complex reaction with cutaneous or systemic manifestations.<sup>1</sup>

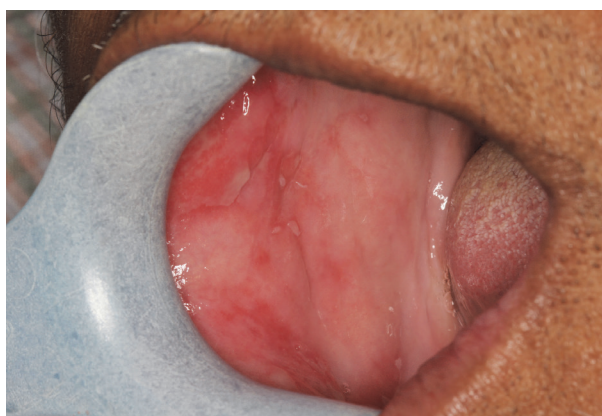


Figure 1: Methotrexate-induced mucosal erosions/ulcerations on the right buccal mucosa