

CASE REPORT

A not very NICE case of endocarditis

Rekha Lopez,¹ Sophie Flavell,² Claire Thomas¹

¹Department of Microbiology, Imperial College NHS Trust, London, UK

²GUM Department, Hawthorn House, Heartlands Hospital, Heart of England NHS Trust, Birmingham B7 5SS, UK

Correspondence to

Dr Claire Thomas;
claireP.Thomas@imperial.nhs.uk

SUMMARY

A 69-year-old man, previously independent and with a pre-existing metallic aortic valve, presented with a history of fevers, confusion and malaise and was diagnosed with prosthetic valve endocarditis. Blood cultures taken on presentation grew *Streptococcus sanguinis* and vegetations were confirmed on transoesophageal echocardiogram. He had had a dental procedure 10 days before presentation but had not received prophylactic antibiotics; he had been receiving antibiotic prophylaxis for dental treatment up until the change in NICE guidelines in 2008. He was treated with high dose antibiotics and was referred for cardiothoracic surgery, but developed a cerebrovascular event, thought to be embolic, and deteriorated and died. Given that the patient had a metallic aortic valve and poor dentition, and therefore was at increased risk of infective endocarditis, should the new guidelines have been followed so rigidly, particularly as American and European guidelines still recommend the use of antibiotic prophylaxis in this patient group?

BACKGROUND

This case highlights concerns around the change in NICE guidelines in 2008, which no longer recommend antibiotic prophylaxis for high risk patient groups such as those with metallic valves. It demonstrates that these guidelines may actually be detrimental to the outcome of patients in this group. Furthermore, current guidelines of the American Heart Association and the European Society of Cardiology continue to recommend prophylaxis for patients at high risk of developing endocarditis, such as in the case presented here.

CASE PRESENTATION

A 69-year-old man, previously independent, with a background of a metallic aortic valve replacement for a bicuspid valve 13 years previously, a permanent pacemaker and hypertension, presented with septic shock. He had a history of poor dentition, and had been given antibiotic prophylaxis prior to dental visits up until the new NICE guidelines in 2008. He had visited the dentist 2 weeks before admission.

He was admitted with a week's history of lethargy, fevers and confusion. He was septic on presentation, and blood cultures grew α haemolytic streptococcus (*Streptococcus sanguinis*) in six bottles. Bacterial endocarditis was confirmed on transoesophageal echocardiogram demonstrating involvement of the mitral and aortic valves, with a paravalvular abscess around the aortic valve. He was started on high dose benzylpenicillin, and synergistic gentamicin, as per the British Society for

Antimicrobial Therapy (BSAC) guidelines. He had two ventricular fibrillation arrests, was intubated and transferred to the intensive care unit. Coronary angiography showed no lesion to explain the arrests, although diffuse disease was present. The patient was transferred from a peripheral hospital for consideration of cardiothoracic surgery. However, he developed a dense left hemiparesis, and CT brain imaging revealed a subacute large right frontal infarct, and so surgery was no longer considered an option. The patient continued to deteriorate and died 6 weeks after presentation.

INVESTIGATIONS

Six blood culture bottles on presentation all grew *S sanguinis* (α haemolytic streptococcus) which is a member of the strep viridans family associated with normal oral flora.

Transoesophageal echocardiogram demonstrated vegetations on the aortic and mitral valves with an associated paravalvular abscess around the aortic valve.

CT of the head 1 week after presentation showed a subacute right frontal infarct.

TREATMENT

IV benzylpenicillin and gentamicin (for 2 weeks synergy) were administered in accordance with BSAC guidelines.

OUTCOME AND FOLLOW-UP

The patient showed few signs of neurological recovery and as cardiothoracic surgery was no longer an option he was transferred back to the original hospital for continuing medical management. Several weeks later he deteriorated and died.

DISCUSSION

This case highlights several issues related to the recent NICE guidelines on infective endocarditis which recommend no prophylaxis prior to dental procedures in at-risk patient groups. The prognosis for infective endocarditis remains poor, with high morbidity and mortality.¹

Since the introduction of the NICE guidelines in 2008,² the prescribing of antibiotic prophylaxis prior to dental procedures has declined dramatically. This has resulted in a 78.6% reduction in prescribing in 12 months as demonstrated by Thornhill *et al.*³ Although their study did not show an overall increase in the incidence of endocarditis following introduction of the new guidelines, it did acknowledge a background use of antibiotic prophylaxis of about 20% which would most likely have included patients who were thought to be at increased risk of endocarditis following a dental

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procedure, such as those with prosthetic heart valves, a prior history of endocarditis and significant congenital lesions.

This background use is thought to be largely driven by patients who are used to getting prophylaxis and are reluctant to stop despite the new guidelines, and clinicians such as cardiologists and general practitioners who are concerned about high risk patients. The lack of an increase in incidence could be because the patient population most at risk of developing infective endocarditis following a dental procedure was not included in the study as they continued to receive antibiotic prophylaxis despite the guideline change. Also, given that infective endocarditis is a rare diagnosis with an estimated incidence of 1.7–6.2 per 100 000 patient years,⁴ a longer period of surveillance is needed to accurately evaluate any increase in the incidence of infective endocarditis following the NICE guideline change.

In contrast to the NICE guidelines, the guidelines of the American Heart Association and European Society for Cardiology still recommend the use of antibiotic prophylaxis for those considered to be at high risk, which include patients with prosthetic heart valves undergoing dental procedures involving manipulation of the gingival or peri-apical region of the teeth or perforation of the oral mucosa.⁶ Both guidelines maintain that a high level of oral hygiene is necessary to prevent and minimise the risk of developing infective endocarditis; however, in patients with pre-existing dental disease this is not always possible and this subgroup has not been taken into account in any of the guidelines so far. We suggest that dentists in collaboration with cardiologists should be allowed to use their clinical discretion to determine which patients are at increased risk due to pre-existing comorbidities such as poor oral hygiene and prosthetic valves. Furthermore, prosthetic valve endocarditis has been shown in several studies to be associated with a poorer prognosis when compared to native valve endocarditis.^{7, 8}

Of interest, we note a recent letter in the *British Dental Journal* highlighting a small qualitative study of dentists within the NHS who felt obliged to follow NICE guidelines, despite over half believing that the American Heart Association guidelines would be more beneficial for their patients.^{9, 10} According to the study, some dentists felt the need to comply with the NICE guidelines, despite their clinical judgement that certain patients warranted antibiotic prophylaxis, out of concern that their actions would be questioned as being against current guidelines.

The devastating consequences of infective endocarditis are demonstrated in this case, where prior to presentation the patient had had a dental procedure without antibiotic prophylaxis, although he had received antibiotic prophylaxis for 10 years with no previous adverse outcome.

This strongly suggests that the use of antibiotic prophylaxis in this case would have been justified given the patient's high risk

cardiac status and pre-existing dental disease. We would suggest that the new guidelines should be reviewed for high risk patients, and that in the meantime decisions should be made by dental and medical professionals on a case-by-case basis, especially for at-risk patients.

Learning points

- ▶ Infective endocarditis although rare, can result in serious morbidity and mortality.
- ▶ *Streptococcus viridans* is abundant in oral flora, so clinicians should be suspicious of a dental source in strep viridans endocarditis.
- ▶ The recent change in the NICE guidelines recommending no prophylaxis in high risk patient groups is questionable.
- ▶ Dentists should be able to make case-by-case judgments for high risk patients without fear of repercussion for not adhering to NICE guidelines in certain circumstances.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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