White Rose Research Online

eprints@whiterose.ac.uk
https://eprints.whiterose.ac.uk
Universities of Leeds, Sheffield and York

Deposited via The University of Sheffield.

White Rose Research Online URL for this paper:
https://eprints.whiterose.ac.uk/id/eprint/96643/

Version: Accepted Version

Article:
Chambers, J.B., Thornhill, M., Shanson, D. et al. (2016) Antibiotic prophylaxis of endocarditis: a NICE mess. Lancet Infectious Diseases, 16 (3). pp. 275-276. ISSN: 1473-3099

Reuse
Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

Takedown
If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.

Antibiotic prophylaxis of endocarditis: a NICE mess

John B Chambers[1]

Martin Thornhill[2]

David Shanson[3]

Bernard Prendergast[1]

[1]Consultant Cardiologists, Cardiothoracic Centre, Guy's and St Thomas' Hospitals, London

[2]Professor of Translational Research in Dentistry, School of Clinical Dentistry, University of Sheffield

[3]Honorary Consultant Microbiologist at Great Ormond Street Hospital for Children, London

Correspondence: Prof JB Chambers, Cardiothoracic Centre, St Thomas' Hospital, London SE1 7EH. U.K. Tel: 44-(0)20-7188-1047 Fax: 44-(0)20-7188-0728 E-mail: john.chambers@gstt.nhs.uk

NICE guidance written in 2008, and revised in 2015 (1), no longer recommends antibiotic prophylaxis for infective endocarditis (IE) in patients at high-risk of IE having high-risk dental procedures. This remains different from every international guideline (2) including a 2015 European Society of Cardiology revision (3). The European guideline committee (3) considered, but rejected, the NICE view. How has this important difference in advice arisen and what are its implications?

The core NICE committee consists of the same individuals, regardless of the subject under review. Detailed experience of the clinical background may not be seen as critical in considering drug therapies or technologies for which data from randomised controlled trials exist. However, judging the advisability of antibiotic prophylaxis for IE requires the understanding of complex observational or case-matched clinical and animal studies. Arguably, this requires expertise and experience in the subject and is better suited to professional bodies than to NICE.

The NICE revision committee made a number of errors, stating, for example, that 'people with prosthetic valves do not appear to be at increased odds of developing IE than people without prosthetic valves based on two studies'. In fact, the two studies were not relevant to the question and the annual incidence of prosthetic valve IE is 0.3-1.2% (3), 10-120 times the estimate within the general population. Another error was to note 'the lack of data on side effects (including anaphylaxis) from antibiotic prophylaxis'. To date,

there have there been no reports in the world literature of fatal anaphylaxis after oral amoxicillin prophylaxis for IE (4,5).

NICE considered that there was no good evidence of significant bacteraemia following invasive dental procedures (1), but examined only studies that included negative pre-procedural blood cultures. However, most of these cultures were positive for skin commensals, not orally derived viridans streptococci. Viridans streptocci were very rare pre-procedure, but were isolated in 35-65% of blood cultures immediately following dental extraction in studies excluded by NICE (6). Furthermore, observational or case-control studies show that IE may be associated with some dental procedures, including extractions, deep-fillings and scaling (7,8). Of course, IE may also occur with bacteraemia associated with daily activities.

NICE also considered that there was no evidence for antibiotic prophylaxis being effective. Although there has been no randomised trial, a number of observational clinical studies show a benefit in high-risk groups (7,9) and animal data demonstrate that a single dose of amoxicillin can prevent streptococcal bacteraemia and IE (7,10). In a recent analysis (11), 277 prescriptions of antibiotic prophylaxis were needed to prevent one case of IE.

Numerous studies show a background increase in the incidence of IE (1). However, a recent study (11) showed that the slope of this increase rose in the UK in the years after introduction of the NICE guidance in March 2008. There has been subsequent debate about the timing of the change in slope

and whether the data are better fitted with a curve than a straight line, but there has been no disagreement about the existence of the change. The study was limited by the lack of microbiological information and it is surprising that IE-related mortality did not rise in parallel with incidence. However, the mortality of IE caused by oral streptococci is lower than IE caused by other organisms and a US study (11) has shown a rise in IE caused by Streptococci in the same time-period.

NICE guidance might appear to simplify dental practice. However, the nature of informed consent obliges dentists to make patients aware of the different guidelines, especially if a patient is at high clinical risk or has a particular concern about antibiotic prophylaxis or IE. The dentist would then need to let the patient make up his or her own mind whether or not to receive antibiotic prophylaxis. This process would therefore be significantly simpler if all guidelines were in agreement.

Conclusion

NICE is most effective when considering drug therapies or technologies for which randomised controlled trial data exist. Expert professional bodies might be expected to be more appropriate for complex clinical judgements, such as the advisability of antibiotic prophylaxis of IE. We suggest that the recently updated European Society of Cardiology guidance (3), remains clinically most appropriate.

REFERENCES

1. National Institute for Health and Clinical Excellence. Prophylaxis against infective endocarditis. Antimicrobial prophylaxis against infective endocarditis in adults and children undergoing interventional procedures. UR http: // www.nice.org.uk/CG064 . March 2008. updated 2015 https://www.nice.org.uk/guidance/cg64/evidence

2. Nishimura RA, Carabello BA, Faxon DP et al. ACC/AHA guideline update on valvular heart disease: focused update on infective endocarditis. Circulation 2008; 118: 887-96.

3. Habib G, Lancellotti P, Antunes MJ et al. 2015 ESC Guidelines for the management of infective endocarditis. Europ Heart J Aug 29, 2015. Doi:10.1093/eurheartj/ehv319

4. Lee P, Shanson D. Results of a UK survey of fatal anaphylaxis after oral amoxicillin. J Antimicrob Chemother 2007;60:1172-3.

5. Thornhill MH, Dayer MJ, Prendergast B, Baddour LM, Jones S, Lockhart PB. Incidence and nature of adverse reactions to antibiotics used as antibiotic prophylaxis. J Antimicrob Chemo. 2015 doi:10.1093/jac/dkv115

6. Shanson D, New British and American guidelines for the antibiotic prophylaxis of endocarditis : do the changes make sense? A critical review. Current Opinion in Infectious Diseases 2008;21:191-199.

7. Chambers J, Shanson D, Hall R, Venn G, Pepper J, McGurk M. Antibiotic prophylaxis of endocarditis: the rest of the world and NICE. J Roy Soc Med 2011; 104: 138-40.

8. Horstkotte D, Rosin H, Friedrichs W, Loogen F. Contribution for choosing the optimal prophylaxis of bacterial endocarditis. Europ Heart J 1987;8 (Suppl J):379-81.
9. Duval X, Alla F, Hoen B et al. Estimated risk of endocarditis in adults with predisposing cardiac conditions undergoing dental procedures with or without antibiotic prophylaxis. Clin Infectious Dis 2006;42:e102-7.
10. Berney P, Francioli P. Successful prophylaxis of experimental streptococcal endocarditis with single-dose amoxicillin administered after bacterial challenge. J Infect Dis 1990;161:281-5.
11. Dayer MJ, Jones S, Prendergast B, Baddour LM, Lockhart PB, Thornhill MH. Incidence of infective endocarditis in England, 2000–13: a secular trend, interrupted time-series analysis. Lancet 2014;385:1219–1228. DOI: http://dx.doi.org/10.1016/S0140-6736(14)62007-9
12. Pant S, Patel NJ, Deshmukh A et al. Trends in infective endocarditis incidence, microbiology and valve replacement in the United States from 2000-2011. J Am Coll Cardiol 2015;65:2070-6.