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Letter to the Editor of the Journal of Oral & Maxillofacial Surgery

"Maxillofacial Surgeons Beware: Some AHA 'Moderate Risk' Patients Develop Endocarditis After Exodontia" – A Response

Brief Title – Antibiotic Prophylaxis for Invasive-Dental Procedures

Martin H. Thornhill, MBBS, BDS, PhD[a,b], Teresa B. Gibson, PhD[c], Frank Yoon, PhD[c], Mark J. Dayer, MBBS, PhD, FRCP[d], Bernard D. Prendergast, BM, BS, DM[e], Peter B. Lockhart, DDS[b], Patrick T. O'Gara, MD[f], Larry M. Baddour, MD[g].

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[a]Unit of Oral & Maxillofacial Medicine Surgery and Pathology, School of Clinical Dentistry, University of Sheffield, Sheffield, UK; [b]Department of Oral Medicine, Carolinas Medical Center – Atrium Health, Charlotte, NC; [c]IBM Watson Health, Ann Arbor, MI; [d]Department of Cardiology, Somerset Foundation Trust, Taunton, Somerset, UK; [e]Department of Cardiology, St Thomas' Hospital, London, UK; [f]Cardiovascular Medicine Division, Brigham and Women's Hospital, and Harvard Medical School, Boston, MA; [g]Division of Public Health, Infectious Diseases, and Occupational Health, Mayo Clinic College of Medicine and Science, Rochester, MN.

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Drs Thornhill, Gibson, Yoon and O'Gara have no non-financial interests that may be relevant to the submitted work. Dr Lockhart is a member of the writing committee reviewing the current AHA guidelines on antibiotic prophylaxis to prevent infective endocarditis. Drs Baddour and Lockhart were members of the AHA Committee on Rheumatic Fever, Endocarditis and Kawasaki Disease, and were involved in producing both the 2007 and 2021 AHA guidelines on prevention of infective endocarditis. Dr Dayer was a consultant to the review committee that produced the 2015 update to NICE clinical guideline 64 on prophylaxis against infective endocarditis. Dr Prendergast was a member of the Task Force on the Prevention, Diagnosis and Treatment of Infective Endocarditis of the European Society of Cardiology (ESC) that produced the 2009 ESC guidelines and acted as an external advisor to the committee that produced NICE clinical guideline 64 on Prophylaxis Against Infective Endocarditis in March 2008.

Correspondence to:

Prof. Martin Thornhill, Unit of Oral & Maxillofacial Medicine Surgery and Pathology, University of Sheffield School of Clinical Dentistry, Claremont Crescent, Sheffield S10 2TA, UK. Tel: +44 (0)751-555-2925, Email: m.thornhill@sheffield.ac.uk

"Maxillofacial Surgeons Beware: Some AHA 'Moderate Risk' Patients Develop Endocarditis After Exodontia" – A Response (Letter to the Editor)

Dear Dr. Thomas B. Dodson, Editor-in-Chief.

We thank Drs Friedlander and Couto-Souza[1] for highlighting our research.[2] However, they have misunderstood our data, misrepresented our findings and consequently drawn incorrect conclusions. In particular, their view that antibiotic prophylaxis (AP) should be prescribed before invasive dental procedures (IDP) for patients at moderate risk of infective endocarditis (IE), and that the American Heart Association (AHA) guidelines should therefore be revised, is not supported by our data. Indeed, our data strongly support the current AHA recommendation that only those at high IE risk should be prescribed AP.[3]

We published the results from two different studies (i) an ~8-million-person cohort study and (ii) a case-crossover study of 3,774 IE-admissions. Both demonstrated a significant association between extractions and oral surgery (OS) procedures and subsequent development of IE. They also demonstrated that AP reduced IE incidence following these procedures in those at high IE risk but not in those at moderate or low risk.

Friedlander's analysis contains numerous errors in the interpretation of our data, e.g., (i) they took the 8 million from the cohort study and 3,774 from the case-crossover study (different studies) to erroneously claim that 3,774 developed IE following IDP. This is incorrect. (ii) They also erroneously assumed that the 831 moderate risk IE patients in the case-crossover study all developed IE following IDP. They did not. This number represents all moderate risk IE patients in the case-crossover study, not just those who developed IE following IDP. These and other errors in their interpretation of our data mean that their conclusions are unsupported by the evidence.

It is worth pointing out, however, that for every 125 high risk individuals undergoing an extraction, and every 45 undergoing an OS procedure, our data showed AP would prevent one IE case (this is the number needed to prevent – NNP). In contrast, AP had no significant effect on the IE incidence in those at moderate risk, and AP reduction of IE incidence following extractions was negligible (NNP=66,667) and not statistically significant in those at moderate risk, while AP non-significantly increased IE incidence following OS procedures and IDP (making NNP calculation impossible) in those at moderate IE risk.

With NNPs of 125 and 45 for extractions and OS procedures respectively in those at high IE risk, AP benefits are likely to strongly outweigh the risks, e.g., adverse drug reactions,[4] promotion of antibiotic resistance and cost.[5] Our data are, therefore, strongly supportive of the current AHA recommendation that high IE risk patients should receive AP. In contrast, with no significant effect, an NNP of 66,667 for extractions, and an incalculable NNP for OS and IDP, guideline committees are unlikely to consider AP benefits outweigh the risks for those at moderate IE risk.

In summary, our data strongly support the current AHA recommendation that high IE risk individuals be given AP before IDP (particularly extractions and OS procedures), [3] but do not support Friedlander and Couto-Souza's view that those at moderate IE risk should also receive AP before IDP.

References:

1. Friedlander AH, Couto-Souza PH: Maxillofacial surgeons beware: Some AHA "Moderate Risk" patients develop endocarditis after exodontia. Journal of Oral & Maxillofacial Surgery, 2022
2. Thornhill MH, Gibson TB, Yoon F, Dayer MJ, Prendergast BD, Lockhart PB, O'Gara PT, Baddour LM: Antibiotic Prophylaxis Against Infective Endocarditis Before Invasive Dental Procedures. J Am Coll Cardiol 80:1029, 2022
3. Wilson WR, Gewitz M, Lockhart PB, Bolger AF, DeSimone DC, Kazi DS, Couper DJ, Beaton A, Kilmartin C, Miro JM, Sable C, Jackson MA, Baddour LM, American Heart Association Young Hearts Rheumatic Fever E, Kawasaki Disease Committee of the Council on Lifelong Congenital Heart D, Heart Health in the Y, Council on C, Stroke N, the Council on Quality of C, Outcomes R: Prevention of Viridans Group Streptococcal Infective Endocarditis: A Scientific Statement From the American Heart Association. Circulation 143:e963, 2021
4. Thornhill MH, Dayer MJ, Prendergast B, Baddour LM, Jones S, Lockhart PB: Incidence and nature of adverse reactions to antibiotics used as endocarditis prophylaxis. J Antimicrob Chemother 70:2382, 2015
5. Franklin M, Wailoo A, Dayer M, Jones S, Prendergast B, Baddour LM, Lockhart PB, Thornhill MH: The cost-effectiveness of antibiotic prophylaxis for patients at risk of infective endocarditis Circulation 134:1568, 2016