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Reply: American Heart Association “Moderate Risk” Patients Develop Infectious Endocarditis After Dental Extractions

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Drs Thornhill and O’Gara have no non-financial interests that may be relevant to the submitted work. 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.

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We thank Drs Friedlander and Couto-Souza(1) for highlighting the importance of our data validating the AHA recommendation that high infective endocarditis (IE) risk patients should receive antibiotic prophylaxis (AP) before invasive dental procedures (IDP).(2) They also queried whether our data suggest that a recommendation for AP in moderate IE-risk patients undergoing dental extractions should be considered.

Our cohort data in moderate-risk patients shows a small but significant association between extractions and IE at 30-days and 4-months but neither was significantly reduced by AP (Tables 4, S6 and S7).

In the case-crossover study, there was no significant association between extractions and IE for those at moderate IE-risk and no significant effect of AP at 30-days (Table 5). Although there was a small, but significant, association between extractions and IE at 4-months in moderate-risk patients (Table S10), AP had no significant effect in reducing this (Table S11).

In neither study did we demonstrate a significant effect of AP in reducing IE incidence following extractions in moderate IE-risk patients. In contrast, AP significantly reduced IE incidence following extractions (at 30-days and 4-months) in those at high IE-risk in the cohort and case-crossover studies. Moreover, IE incidence within 30-days of an extraction was 8,968 cases/million extractions and AP reduced this by 8,029 to 939 cases/million extractions (OR 0.13, 95%CI 0.03-0.34, $p < 0.0001$) in those at high IE-risk (Table 4). That is, 125 extractions in those at high-risk would need to receive AP to prevent 1 IE case (number needed to prevent, NNP). In contrast, in individuals at moderate IE-risk, AP only reduced IE incidence by 15 from 105 to 90 cases/million extractions (OR 0.93, 95%CI 0.10-4.12, $p = ns$). That is, 66,667 extractions would need AP coverage to prevent 1 IE case.

With an NNP of 125, guidelines committees are likely to recommend AP of extractions in those at high IE-risk, but with a non-significant effect, and an NNP of 66,667, the benefits of recommending AP are unlikely to outweigh the risk of adverse reactions or the potential of fostering the development of antimicrobial resistance among bacteria in individuals at moderate IE-risk.

References:

1. Friedlander AH, Couto-Souza PH. American Heart Association “Moderate Risk” Patients Develop Infectious Endocarditis After Dental Extractions. *Journal of the American College of Cardiology* 2022:Letter to the Editor.
2. Thornhill MH, Gibson TB, Yoon F et al. Antibiotic Prophylaxis Against Infective Endocarditis Before Invasive Dental Procedures. *J Am Coll Cardiol* 2022;80:1029-1041.