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Would endodontic procedures really need antibiotic prophylaxis?

Sir, we read with interest the letter "Would endodontic procedures really need antibiotic prophylaxis?". While we agree more research is needed, current data does not support the authors' assertion "endodontic procedures constitute a low incidence of bacteraemia, which is not reduced by antibiotic prophylaxis", or their conclusion that antibiotic prophylaxis (AP) is of no benefit.

The authors cite a study by Reis et al,[1] that detected bacteraemia following 4/21 (19%) endodontic procedures in high-IE-risk individuals given AP, and 2/11 (18%) low-IE-risk patients who received no AP, using qPCR. The authors claimed this showed AP did not reduce the risk of bacteraemia. However, qPCR cannot distinguish live bacteria from recently killed bacteria (blood cultures are needed for that). It is misleading, therefore, to conclude AP was ineffective and had no effect on endodontic-procedure related bacteraemia.

Others have found higher bacteraemia incidence. Debelian et al observed bacteraemia in 54% of cases following endodontic instrumentation 1mm beyond the apex, and 31% when 1mm short of the foramen.[2] Savarrio et al also demonstrated 30% bacteraemia following instrumentation short of the apex.[3] Therefore, ~18-54% bacteraemia following orthograde-endodontics seems likely. Given blood is normally sterile, this is neither insignificant nor low. And, unlike bacteraemia caused by 'activities of daily life', e.g. toothbrushing, it is the consequence of a dental-procedure and potentially preventable.

Although no properly-designed studies have examined if AP reduces endodontic procedure-related bacteraemia, several studies have demonstrated that AP reduces bacteraemia following other dental-procedures (particularly extractions), and two studies have shown that AP significantly reduces IE-risk following these procedures in high-risk individuals.[4] The letter's implied conclusion, that AP is unnecessary for orthograde endodontic-procedures, is not therefore supported by current-evidence.

The letter authors also imply antibiotic-stewardship and value-based health-concerns argue against AP, given the large-number of endodontic-procedures performed in the UK annually (citing NHS-data). Although this data records 191,293 endodontic-procedures for 2022-23, current European and American guidelines recommend AP only for high-IE-risk patients (~0.6% of the population).[4] Thus, only ~1,147 of these procedures would require AP. Extractions data suggests giving AP to this number of patients could prevent 8-9 IE-cases annually, including 2-3 deaths.[4] Although bacteraemia-incidence following orthograde endodontics (~19-54%) may be lower than for extractions (~62-66%), the devastating consequences of IE, including 30% first-year mortality, suggest it would be prudent for high-risk patients undergoing endodontics to receive AP, as recommended by European and American guidelines, until good-quality research demonstrates that not protecting patients this way is safe.

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2. Debelian GJ, Olsen I, Tronstad L. Bacteremia in conjunction with endodontic therapy. Endod Dent Traumatol. 1995;11(3):142-9.
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