Once again, less pain with articaine!

Comparison of articaine, lidocaine and mepivacaine for buccal infiltration after inferior alveolar nerve block in mandibular posterior teeth with irreversible pulpitis. *Br Dent J* 2020; 228: 605–608. <https://doi.org/10.1038/s41415-020-1434-9>.

Local anaesthetics (LA) represent the most effective drugs for the prevention and management of peri-operative and post-operative pain.

Acute endodontic pain often results in failed local anaesthesia. Why does that happen? There are many factors that may contribute to difficult or indeed ineffective anaesthetisation, especially of mandibular posterior teeth with irreversible pulpitis. For instance, accessory nerve supply, the variable course of the inferior alveolar nerve, variation in foramen location, and a bifid alveolar nerve can be local reasons for high failure of inferior alveolar nerve block (IANB).

Of the many LA agents available, articaine (most commonly formulated as a 4% solution with adrenaline) is unique, mainly for two reasons. Firstly, it is the only amide local anaesthetic that contains a thiophene ring, instead of a benzene ring. This increases its liposolubility, as well as its potency. Secondly, articaine is the only widely used amide local anaesthetic that also contains an ester linkage. Ester linked LAs undergo metabolism as soon as the drug diffuses into capillaries and veins. Amide LAs enter the blood as still active drugs, circulating throughout the body until they enter the liver where they undergo metabolism by hepatic microsomal

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Expert view: Ian Corbett

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Successful anaesthesia of teeth with irreversible pulpitis is frequently difficult to achieve, particularly in mandibular molars, causing the patient discomfort and the practitioner stress. We all have our routines honed from experience to manage such teeth, but evidence relating to techniques and anaesthetic solutions is always welcome. For most an inferior alveolar nerve block (IANB) with lidocaine is the starting point,¹ frequently followed by a buccal infiltration (BI) as a simple and well tolerated adjunct, as in this study. Here the authors gave the buccal infiltration only after assessing their IANB as having failed, as judged by lip numbness and cold testing of the tooth, with an IANB failure rate of 71%, whereas in practice the two techniques are often given consecutively from the outset. Buccal infiltration of the three most common UK anaesthetic solutions – lidocaine, articaine and mepivacaine – are compared. Many local anaesthetic studies use electronic pulp testing to determine anaesthetic success, however, this is not always reliable in multi-rooted molar teeth or teeth with inflamed pulps and the authors have here defined success

as the ability to treat the tooth with no pain or mild pain, directly relevant to clinical practice. If we focus on the patient perceived pain during endodontic access as the most relevant result of the study, the authors report a statistically significant difference in success rates after articaine buccal infiltration compared to both lidocaine and mepivacaine, in the region of 80% compared to 60%, a little higher than many groups,² and a similar superiority in terms of the VAS scores for the groups. Unfortunately, the authors do not provide data on the successful completion of treatment in their IANB success group with which to compare.

With the average VAS score for all three groups indicating our patients are still suffering moderate pain during treatment following a lidocaine IANB and articaine BI, I think we can conclude that this combination is not sufficient alone but may provide a good starting point:³ the most reliable method of managing mandibular molar teeth with irreversible pulpitis remains intraosseous anaesthesia.⁴ ■

References

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