Comparison of the efficacy of 4% articaine and 2% mepivacaine in an incisive/mental nerve block

Keywords: Articaine, Mepivacaine, Incisive nerve, Mental nerve, Mental foramen, Incisive/mental nerve block

Background

The incisive/mental nerve block is a common technique for pain control in procedures involving the lower anterior teeth and premolars, offering quick onset and short duration, making it more comfortable for patients compared to the inferior alveolar nerve block. The choice of anesthetic agent is crucial for the technique's success. While 4% articaine has shown a higher success rate than 2% lidocaine, it may carry a higher risk of neurotoxicity. In contrast, 2% mepivacaine is considered safe and widely used, but there has been no direct comparison of its efficacy with articaine in this specific procedure. This study aims to compare the safety and efficacy of 4% articaine and 2% mepivacaine to identify the optimal anesthetic choice for the incisive/mental nerve block.

Objective

To compare the efficacy of 4% articaine and 2% mepivacaine in incisive/mental nerve block.

Methodology

This research was a prospective, randomized, double-blind controlled trial involving volunteers who received two incisive/mental nerve blocks at separated appointments, one month apart, with different anesthetic agents. Before each injection, baseline electric pulp tests (EPT) were conducted on the control tooth (canine on the opposite side of injection) and on the lower second premolars, first premolar, canines, lateral incisors, and central incisor on the injection side. After the injections, EPTs were repeated on these teeth to assess the anesthesia success rate, onset, and duration.

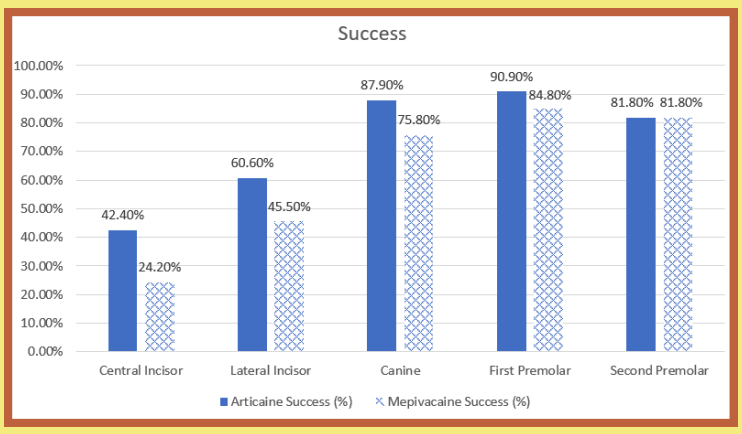
Conclusion

The incisive/mental nerve block was highly effective for anesthesia in the lower canine, first and second premolars, with no significant difference in success rates between the two anesthetic agents. However, 4% articaine provided a faster onset of anesthesia for the lower canine, first premolar, and second premolar. For the lower central and lateral incisors, additional techniques, such as buccal infiltration or bilateral nerve blocks, would be necessary due to cross-innervation from the opposite side.

Results

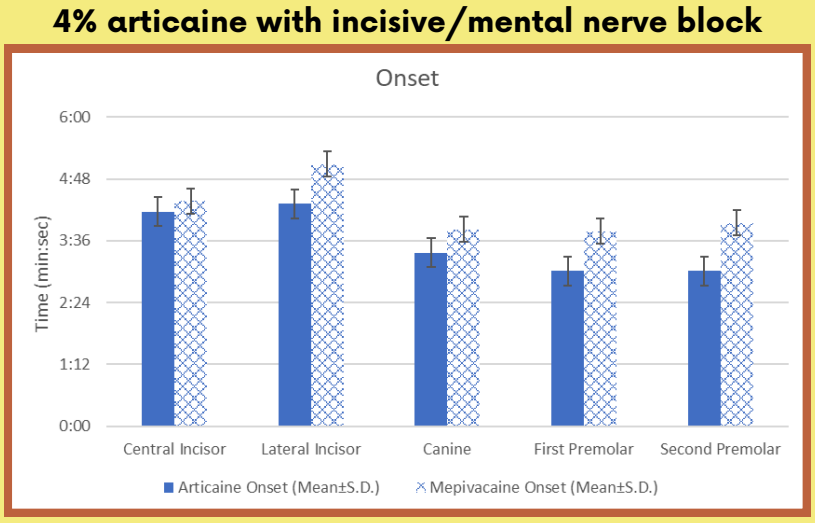
Success: Articaine showed higher success rates in all teeth compared to mepivacaine, but all had no statistically significant differences.

Figure 1. Anesthetic success rate of 2% mepivacaine and 4% articaine with incisive/mental nerve block



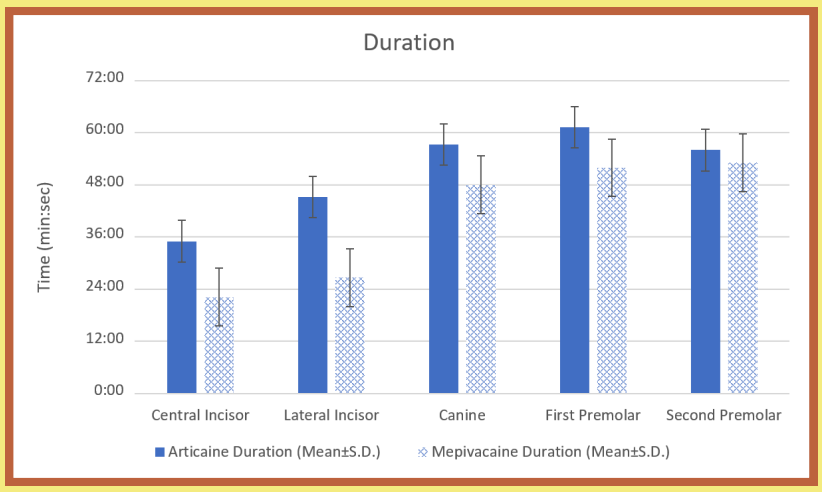
Onset: Our results indicated faster onset in all five teeth when comparing articaine with mepivacaine. However, statistically significant differences were only observed for the canine, first premolar, and second premolar.

Figure 2. The mean onset of 2% mepivacaine and 4% articaine with incisive/mental nerve block



Duration: 4% articaine had a longer duration in all five teeth compared to 2% mepivacaine, but only lateral incisors showed a statistically significant difference.

Figure 3. The mean duration of 2% mepivacaine and 4% articaine with incisive/mental nerve block



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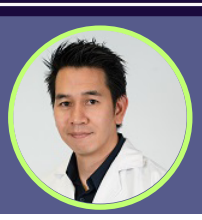
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