



Pre-operative oral medication for successful pulpal anaesthesia in mandibular molars with symptomatic irreversible pulpitis

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Comment on: Hegde V, Shanmugasundaram S, Shaikh S, *et al.* Effect of preoperative oral steroids in comparison to anti-inflammatory on anesthetic success of inferior alveolar nerve block in mandibular molars with symptomatic irreversible pulpitis—a double-blinded randomized clinical trial. *J Endod* 2023;49:354-61.

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Profound pulpal anaesthesia of maxillary teeth during endodontic procedure can be adequately achieved by the infiltration of anaesthetic solution at the level of root apices. However, for mandibular teeth endodontic procedure a nerve block is required. Inferior alveolar nerve block (IANB) is the most common anaesthetic technique used to anesthetize mandibular teeth (1). The high failure rates of IANB presents with a range of 30–80% and even more in patients with symptomatic irreversible pulpitis (SIP) (2). To explain this phenomenon of failure rates, the purposed reason is nociceptor activation in SIP. Other reasons may be a decrease in local pH, accessory innervation and tachyphylaxis of anaesthetic solution (3,4). In SIP success rate might be increased by approach of buccal or lingual infiltration, intraosseous or periodontal ligament supplementary anaesthetic technique, anaesthetic solution other than lidocaine, change in volume of anaesthetic solution and use of preoperative oral medication like non-steroidal anti-inflammatory drugs (NSAIDs) and steroids (5-7). Both steroids and NSAIDs inhibit the production of prostaglandins (PGs), leukotrienes and thromboxane A₂ which ultimately reduce the nociceptor activation, thereby affecting the acute inflammatory response (8,9).

Literature suggested that oral medication with NSAIDs, steroids or their combinations before administration of an

IANB in teeth with SIP may aid with increasing the success rate of pulpal anaesthesia (10-13). But nowadays even with a greater understanding of SIP and the efficacy of different local anaesthesia delivery systems for profound pulpal anaesthesia with various supplementary techniques, neither technique gives good success rate as compared to infiltration anaesthesia in maxillary molars. This unresolved issue needs to be more discussed, researched and implemented as proper protocol for painless treatment procedure.

This perspective randomised clinical control study titled “*Effect of preoperative oral steroids in comparison to anti-inflammatory on anesthetic success of inferior alveolar nerve block in mandibular molars with symptomatic irreversible pulpitis—a double-blinded randomized clinical trial*” by Hegde *et al.* (14) to find out answer of steroids and NSAIDs to manage SIP.

I am glad to write an editorial commentary on this trial which is article in press in the “*Journal of Endodontics*” Jan 2023. The article deals with the comparative efficacy of steroids versus NSAIDs as pre-operative medication for profound pulpal anaesthesia. The author determined the sample size of 184 patients and they were divided into four groups as per pre-medication given orally: placebo; 10 mg of ketorolac (KETO), 4 mg dexamethasone (DEXA) and 20 mg of prednisolone (PRED). IANB of 2% lidocaine with 1:100,000 adrenaline given to patient. After 15 minutes

endodontic procedure steps of access cavity preparation and instrumentation of root canal were attempted. Heft-Parker visual analog scale (HP-VAS) of 0–10 was used for determining successful and failure pulpal anaesthesia. The failed cases were managed with supplementary techniques like intra pulpal, intra-ligamentary and intra-osseous injection.

The result of this trial revealed that the success rate after using NSAIDs and steroids before IANB in SIP is 21.7% (placebo), 56.5% (PRED), 60.9% (DEXA), and 65.2% (KETO) respectively. When patients were pre-medicated orally with PRED, DEXA, or KETO, the success rate of IANB was significantly increased as compared to the placebo. However, no statistically significant differences between PRED, DEXA, and KETO were seen. In the literature studies dealing with SIP in mandibular molars, using IANB only shows success rate of up to 40–50%, whereas, in this study the success rate was 21.7% (3). For improving the success rate of mandibular anaesthesia, various efforts have been dedicated which provides conflicting results in endodontic literature from the past decade. To give oral preoperative dose of NSAIDs and steroids is the one possible and extensively reported option (5,6). One of our articles reported the success rate of IANB in patients with SIP does not significantly affect after preoperative oral medication with paracetamol or KETO (7). Other clinical study reported similar evidence in literature which does not significantly affect (8-12). The use of pre-operative medication orally result increase in success of pulpal anaesthesia in SIP patients in some trials and that in favour of NSAIDs and steroids (11,13-15). Pulikkotil *et al.* conducted a systematic review and network meta-analysis which concluded that NSAIDs and steroids using DEXA significantly increased the success rate of anaesthetic solution with IANB in patient of SIP (16).

The reader may question some of points from this study which may need to be clarified:

- (I) Similar methodology has been used in previous studies with SIP by the authors;
- (II) Sample size deserves a better description for trial than from previous study using openepi software (<https://www.openepi.com/>);
- (III) Why HP-VAS (0–10 cm) two end point scale was used not 0–100 mm which is more reliable;
- (IV) Only standard IANB was administered using 2% lidocaine with 1:100,000 adrenaline, why author didn't use 4% articaine buccal infiltration for better pulpal anaesthesia of mandibular molars as evidence suggests that 4% articaine buccal

infiltration associated with 2% lidocaine IANB are more effective;

- (V) Limited sample size of 46 patients in each group which is plausible limitation of this study;
- (VI) Future trials with larger sample size further suggested.

Though some oral pre-operative medications appear to be promising, their relative efficacy is not known. Future high-quality randomized controlled trials are required that highlight this significant topic which requires further clarification.

Finally, authors of this study shed a little light on the obscure issue of anesthetic success of IANB for profound pulpal anesthesia and therefore deserve our respect and congratulation.

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Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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