LOCAL ANESTHESIA REVERSAL AGENTS

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EDUCATION

***Abstract**: Local Anesthesia forms one of the pillars of clinical pediatric dentistry. Even though a painless treatment can be delivered, the effect of anesthesia can persist even after the treatment. This article discusses those agents that effectively antagonise the effects of local anesthesia, thereby reducing its adverse post-treatment effects.*

Keywords: Local Anesthesia, Reversal Agents, Pediatric Dentistry

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Local Anesthesia (LA) forms the backbone of pain control techniques in dentistry. Despite the range of LA agents available, the ones that work for an intermediate duration are most commonly used in dentistry. One such agent is lidocaine.

Lidocaine is used with the inclusion of a vasopressor [epinephrine or levonordefrin (in the US)], which provides anesthesia for 55-65 min when infiltrated and for 80-90 minutes when administered as a nerve block. The usual length of dental treatment is approximately 44 minutes. After the treatment is over, the effect of the anesthesia will persist till its total duration of action. This post-treatment effect of LA can cause discomfort in 3 major areas — functional, sensory, and perceptual. It may occasionally lead to a self-inflicted oral injury in the patient. The most commonly injured tissues are the lips and tongue. Injury to the latter is more common in younger children and mentally disabled patients.[1]

HOW TO REDUCE THE EFFECT OF LA?

In the 1980s, a non-pharmacological technique known as Transcutaneous Electrical Nerve Stimulation (TENS) was successful in shortening the duration of residual soft tissue anesthesia. Pharmacological means to reverse the effect of LA are also prevalent. These include administration of Phentolamine Mesylate and Hydralazine Hydrochloride. Phentolamine Mesylate (OraVerse, Septodont, Inc.) is a short-acting, competitive antagonist (at peripheral alpha-adrenergic receptor), which increases vasodilation at the region of concern.[2 3]

Hydralazine Hydrochloride (HCl) modifies the duration of anesthesia by two mechanisms. Firstly, it can act as a vasodilator (similar to OraVerse). Secondly, it alters the pH and causes acidification of the tissues at the injection site (greater effect than OraVerse). A greater proportion of the anesthetic agent exists in its cationic form rather than its basic form. Administration of Hydralazine HCl can increase the hydrogen ion concentration in the injection site. This shift in equilibrium reduces the diffusion of the anesthetic agent to the target tissues, leading to a lowered intensity of anesthesia and accelerated recovery from soft tissue anesthesia.[4]

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