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Editorial

Beyond The Local Anesthesia

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Editorial

One of the most important events in dentistry history was the discovery of local anesthetics in 1859 by Albert Niemann (1834 – 1861). In fact, this event represents the beginning of a new era in dentistry. Despite the adverse and lethal effects of cocaine, the first local anesthetic used in dentistry, this finding permitted the develop of other local anesthetics with less adverse effects and better safety index such as procaine, lidocaine, mepivacaine, bupivacaine, prilocaine and more recently ropivacaine and articaine. Local anesthetics constitute a group of elementary drugs in the professional arsenal of dentistry and are the most used drugs in this area. They act by preventing the conduction of the nociceptive electrical impulses in a reversible way, generating a loss of sensitivity to pain. Local anesthetics internally block Na^+ voltage gated channels on neuronal fibers, thus decreasing nerve conduction. Na^+ voltage gated channels are complex structures formed by two β subunits (β_1 and β_2) and a large α subunit in whose central part is located the entry pore for this ion.

In the last 100 years, the reversible local anesthetic effect added to the wide therapeutic index of these agents have allowed to perform invasive procedures in the oral cavity in different areas such as endodontics, oral and maxillofacial surgery, implantology, restorative dentistry and periodontics without pain during the performance of these treatments. This fact has meant an unprecedented advance in the world history of dentistry.

Several research have been conducted and published with the aim of improving the pharmacokinetic profile of these drugs such as inclusion complexes with cyclodextrins and encapsulation in liposomes and nanocapsules. These studies are aimed at increasing the liposolubility of these drugs through the neuronal cell membrane, as well as avoiding the use of vasoconstrictors that are present in most local anesthetic formulations to counteract the vasodilator effect of these drugs. Moreover, this new formulations could reduce the side effects of this drugs, because these cell carriers act as reservoir and from there they release (in a sustained manner) the local anesthetics molecules. These latest advances could allow in the near future the topical use of these agents and limit the use of dental needles for their administration.

Recently, there has been special attention in relation to the cytotoxic effects produced by local anesthetics. It has been shown, for example, that these agents in low tissue concentrations (as used in clinical practice) produce an induction of cellular apoptosis. This fact could mean a possible coadjuvant treatment to the base treatment of some types of cancer. Could it be that we are facing a group of old drugs with a new target?

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