SHORT COMMUNICATION

Intravenous Regional Anesthesia (IVRA)

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ABSTRACT

In order to numb the hand and forearm, August Bier originally introduced Intravenous Regional Anesthesia (IVRA) in 1908. Brachial plexus blocks caused the procedure to become less popular, but Holmes brought it back in 1963 by using lidocaine instead of procaine. In circumstances where it is safe and simple to administer an occlusive tourniquet, IVRA is appropriate for surgeries on the distal extremities. Although it can be utilized for treatments affecting the lower extremities, it is primarily employed for surgeries on the upper extremity

Key Words: *Intravenous regional anesthesia; Core components; Guidelines; Heart valve surgery; Heart valve replacement*

INTRODUCTION

The simplicity, dependability, and affordability of IVRA are its main benefits [1]. It is a straightforward regional anesthetic procedure with success rates ranging from 94% to 98% [2]. These factors continue to make it a popular option among anesthesiologists. The use of this technique is restricted to brief procedures (about 20 minutes to 60 minutes) due to anesthesia duration and tourniquet time restrictions. This approach is most suited for procedures carried out in an ambulatory setting because of the quick recovery of function.

There are some restrictions connected to IVRA, and those worries about using it must be taken into account [3]. Local Anesthetic (LA) toxicity, delayed onset of action, inadequate muscle relaxation, tourniquet pain, and low postoperative analgesia are only a few of the issues raised [4]. Rapid onset of sensory and motor block, reduced intraoperative and tourniquet discomfort, sustained post-deflation analgesia, and minimal side effects are characteristics of the optimal IVRA treatment. There are many LA alternatives and adjuncts for IVRA, each with its own benefits and drawbacks. Finding the best IVRA solution can be difficult.

Lidocaine is the most commonly used LA for IVRA in North America. Although it has advantages, its short duration of action could limit the amount of postoperative analgesia that can be given [4]. A longer-acting medication could be able to help. A long-acting medication once used for IVRA, bupivacaine, is no longer advised due to the possibility of an irreversible cardiac arrest [5,6]. Less cardiac conduction depression is caused by ropivacaine, a bupivacaine derivative that is manufactured as a pure levorotatory enantiomer [7-10]. Because it has a lower toxicity profile than bupivacaine and the potential to provide longer and enhanced analgesia in comparison to lidocaine, its use has become more widespread. Another well-liked LA for IVRA is prilocaine, which is also the most widely applied medication.

The least hazardous of the amino-amide local anesthetics, it has a brief duration of action [11]. In an effort to enhance IVRA, a number of adjuncts that are added to LA have been researched, including opioids, muscle relaxants, Nonsteroidal Anti-Inflammatory Medications (NSAIDs), clonidine, potassium, and alkalizing agents. A previous study conducted a systematic analysis of IVRA adjuncts and found that NSAIDs were most effective for enhancing postoperative analgesia following IVRA [12]. In the ongoing hunt for the appropriate adjunct, new studies are continually released.

LOCAL ANESTHETIC

Regarding LA, it seems that all three drugs have similar intraoperative results (onset of sensory and motor block, tourniquet pain). The variations between these medicines are more apparent when evaluating postoperative results. Limited postoperative pain relief after tourniquet deflation is one of the main issues with IVRA, and the evidence from this research reveals that ropivacaine has the most to offer in terms of enhancing postoperative analgesia. Ropavacaine's lengthy residual anesthesia may be brought on by the drug's sluggish release from tissue binding sites and consequent slow rise in plasma concentrations. When ropivacaine was contrasted with lidocaine, this benefit became particularly clear.

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OPIOIDS

Anesthesiologists have tried to take advantage of the existence of peripheral opioid receptors by using fundamental ideas of peripheral opioid activity to enhance the quality of intraoperative and/or postoperative regional anesthesia [13]. The existence of opioid receptors and their endogenous ligands in the peripheral nervous system, as well as their impact on the modulation of inflammatory pain, served as the scientific foundation for this notion [14].

CONCLUSION

Although prilocaine and lidocaine are efficient LA agents, they don't offer any postoperative advantages. As solo adjuncts, morphine, fentanyl, and meperidine do not show clinically significant advantages or increase the risk of side effects. Data on sufentanil are scarce, however, it seems to hasten the onset of sensory block. Tramadol has a quicker onset of sensory block and greater tourniquet tolerance, but it does not consistently improve postoperative outcomes and carries a higher risk of mild side effects. The quality of motor block is improved by muscle relaxants but delayed motor recovery results as a result. Fentanyl and muscle relaxants can be used to provide an IVRA-equivalent quality with a 50% lower LA dose but at the cost of a sensory block's onset that may take longer to develop.

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