Introduction

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Ultrasound-Assisted Nerve Blocks

In recent years there has been a growing interest in the practice of regional anesthesia and, in particular, peripheral nerve blocks for surgical anesthesia and postoperative analgesia. Peripheral nerve blocks have been found to be superior to general anesthesia as they provide effective analgesia with few side effects and can hasten patient recovery. Unfortunately, the practice of regional anesthesia does not enjoy widespread endorsement because of inconsistent success, varying from one anesthesiologist to another. Current methods of nerve localization (eg, paresthesia and nerve stimulation) are essentially "blind" procedures, since they both rely on indirect evidence of needle-to-nerve contact ***(Choyce A et al, 2001) (Urmey W et al, 2002).*** Seeking nerves by trial and error and random needle movement can cause complications. Although uncommon, complications such as intravascular local anesthetic injection resulting in systemic toxicity, inadvertent spinal cord injury following interscalene block, pneumothorax following supraclavicular block, and nerve injury have all been reported ***(Rodriguez J et al, 1998).***

Imaging guidance for nerve localization holds the promise of improving block success and decreasing complications. Among imaging modalities currently available, ultrasonography seems to be the one most suitable for regional anesthesia. Perhaps the most significant advantage of ultrasound technology is the ability to provide anatomic examination of the area of interest in real-time ***(Perlas A, 2004).*** Ultrasound imaging allows one to visualize neural structures (plexus and peripheral nerves) and the surrounding structures (e.g., blood vessels and pleura), navigate the needle toward the target nerves, and visualize the pattern of local anesthetic spread ***(Chan VWS, 2003).***

Introduction

The key requirement for successful regional anaesthetic blocks is to ensure optimal distribution of local anaesthetic around nerve structures. This goal is most effectively achieved under sonographic visualization. Direct ultrasonographic visualization significantly improves the outcome of most techniques in peripheral regional anaesthesia. With the help of high-resolution ultrasonography, the anaesthetist can directly visualize relevant nerve structures for upper and lower extremity nerve blocks at all levels. Such direct visualization improves the quality of nerve blocks and avoids complications.The use of ultrasound seems to enhance not only the traditional brachial and lumbosacral plexus blocks but also the common techniques used in invasive pain therapy, such as stellate ganglion and facet nerve blocks. Further studies are needed to establish whether ultrasonography can improve neuroaxial techniques. Promising results have also been obtained in children, in whom most types of block are performed under sedation or general anaesthesia **(Marhofer *et al*, 2004).**