

Regional Anaesthesia: Why?

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General anaesthesia and peripheral neuronal blockade are techniques, which were introduced into clinical practice than 150 years ago.

Although general anaesthesia was accepted significantly faster due to effective new drugs and apparent ease of handling, neuronal blockades have gained more and more importance in the last years. Reasons therefore are newer equipments such as industrially produced needles and catheter sets, nerve stimulators and ultrasound guidance, which has facilitated that neuronal blockade techniques can be used not only for intraoperative anaesthesia but also for perioperative analgesia without any additional major risks for our patients. In parallel to epidural as well as peripheral blockades a change of paradigms has taken place using catheter instead of single shot techniques. This allows the loading dose of the local anaesthetics to be installed in a safe and controlled way, to reload an adapted dose whenever required and to extend the analgesia perioperatively by these techniques using lower concentrations of the same drugs or of a drug combination. Today a great number of short, middle or long acting local anaesthetics are available to choose the right drug for any particular case. Short and middle acting drugs are characterised by a faster onset compared to long acting drugs, but toxic plasma levels are observed frequently during long time application. Therefore, long acting local anaesthetics such as bupivacaine, ropivacaine or levobupivacaine are the first choice drugs for long time application via peripheral nerve or epidural catheters for perioperative anaesthesia and analgesia. By using low concentrations of these potent drugs even for a longer period of time, usually no toxic plasma levels are seen with the exception of artificial intravascular injections.

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Recently multiple meta-analyses (1,2,3,4) have shown consistently improved analgesia with regional anaesthesia techniques, however significant better outcomes have been shown only for specific subgroups. Specific outcomes in specific types of surgery such as bowel recovery and lung function (5) after abdominal thoracic surgery can be improved by neuroaxial blockade. The main advantage of regional anaesthesia is that it provides a high level of anaesthesia to a selected region of the body while having little or even none effect on other areas, such as heart, lungs and brain. In regional anaesthesia usually protective reflexes of the patients remain intact. An additional benefit of regional anaesthesia and one of the major reasons to combined general and regional anaesthesia is that it helps control accurately postoperative pain, which can have significant negative effects on an otherwise good surgical result. In summary, you may require less general anaesthetics intraoperatively and less pain medication postoperatively, which can avoid nausea, grogginess and respiratory depression that often result from those medications. In addition, neuroaxial techniques are the technique of choice for obstetric analgesia and anaesthesia, as has been shown regarding maternal mortality for section caesarean (8).

In certain indications, peripheral nerve blocks may have the potential to replace neuroaxial blocks while maintaining the benefits of the regional technique, such as paravertebral blocks for thoracotomies or femoral and ischiadicus blockades for knee replacement. Meanwhile even in the critically ill patients it is accepted that regional anaesthesia and analgesia can help to improve respiratory function, bowel function, mental status and patient comfort secondary to its opioid-sparing effects. In particular for older patients simple regional anaesthesia without any additional sedation may help to reduce postoperative cognitive dysfunction, which is a major problem in geriatric anaesthesia.

Newer aspects of regional anaesthesia show that even after major cancer surgery long time outcome is improved using regional anaesthesia. Reasons therefore are still speculative but better postoperative analgesia and lower stress response could be one explanation of these phenomena. On the other side regional anaesthesia and local anaesthetics have significant effects on the human immune system, which also could be an explanation for the better outcome for cancer surgery using regional anaesthesia alone or in combination with general anaesthesia (9,10). However limitations for the use of regional anaesthetic techniques are mainly associated with bleeding risks, hemodynamic side-effects, difficulties in neurological assessment and finally the potential of local anaesthetic toxicity (6,7). Therefore a risk-benefit-analysis for each patient is necessary.

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