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Postoperative pain: a continuing challenge

The understanding of the basic neurophysiology of pain has improved considerably in recent years. The important concepts are those of plasticity, and of a multicomponent system. We are not dealing with a simple, fixed pathway but with a dynamic, plastic system which is capable of undergoing major functional changes in response to painful stimuli from the periphery and which is subject to control from both a spinal and a supraspinal level. Methods of acute pain control have to be imposed on to this complex system.

The objectives of postoperative pain control should be to minimise discomfort, facilitate recovery and avoid treatment-related side-effects. The article by Spittal and Hunter on pages 85–88 of this issue shows that simple methods of analgesia are feasible, safe, and effective. It also shows that surgeons can play an important role in the management of postoperative pain. These are not new discoveries. The *Annals* has published several such reports and some are cited by the authors. Simple and effective analgesia has been produced using topical local anaesthetics delivered by spray, ointment, irrigation, or wound perfusion. Infiltration of the wound edges with local anaesthetic is also highly effective and the benefits may be long lasting *(1)*.

Peripheral nerve blocks and plexus blocks are also easily performed either by surgeon or anaesthetist before operation, even if the patient is having a general anaesthetic. Care should be taken to avoid damaging nerves by inadvertent intraneural injection while the patient is asleep. A catheter can readily be inserted into a plexus sheath and a continuous infusion of local anaesthetic used to provide total analgesia. Epidural and intrathecal techniques are capable of producing complete pain relief without depression of the sensorium but produce significan side-effects. Intrapleural analgesia may play a limited role after unilateral thoracoabdominal surgery.

Although Spittal and Hunter failed to establish any advantage for the group who received the field block before the surgical incision, there is currently great interest in the concept of pre-emptive analgesia. A number of trials have suggested that the use of neural blockade before surgery, or the use of a regional anaesthetic technique during surgery, can lead to reduced postoperative pain *(2)*. There is also evidence to suggest that the preoperative use of opioids or non-steroidal anti-inflammatory drugs (NSAIDS) will produce similar effects. The combination of different methods may be an even more potent influence *(3)*. Effective perioperative analgesia may also influence long-term sequelae and minimise various postsurgical pain syndromes such as occur after amputation *(4)*. Prevention is better than cure!

A combination of neural blockade, opioid and NSAID targets three separate mechanisms of the nociceptive pathway and it has been suggested that postoperative pain could be totally eliminated in virtually all patients by using such a balanced technique *(5)*. Balanced anaesthesia long ago superseded ether and chloroform; now we have the potential of balanced analgesia.

Mandatory, standard regimens cannot cater for the wide variability in pharmacokinetic and pharmacodynamic factors, nor for the wide variation in the incidence, intensity and time course of each patient's pain, nor for the plasticity of the nervous system, so it is essential for management to be individualised for each patient *(6)*.

Opioids remain the mainstay of postoperative pain management but the method in which these drugs are employed often displays poor pharmacokinetic and clinical logic. Intramuscular injection results in variable uptake, onset, peak concentration and duration, and therefore uneven pain control. The combination of the intramuscular route with so called p.r.n. administration leads to even greater uncertainty and wider variability. The intravenous route offers immediate, reliable uptake and rapid onset so that the dose of opioid can be titrated against pain either as an intermittent bolus or as an infusion. Control of the administration by the patient (Patient Controlled Analgesia) can result in excellent pain relief and gains enthusiastic approval by patients and staff *(7)*. Subcutaneous infusions are a simple alternative while transdermal fentanyl points the way to future strategies *(8)*.

The role of spinal opioids remains uncertain despite widespread and often uncritical acceptance. Small doses of spinal opioids are capable of producing analgesia of long duration. Whether the quality of analgesia is better than that of simpler, less invasive alternatives is questionable *(9)*. Recent reports suggest that the safety of these methods is more assured than previously thought *(10)*, but these techniques should be reserved for major operations where the possible benefits justify the increased risk.

The opioids act centrally and perhaps peripherally. The NSAIDs act mainly in the periphery. These drugs are enjoying renewed attention and may have an increasing role to play in postoperative pain control. Newer

injectable NSAIDS such as ketorolac and diclofenac have been shown to be potent analgesics with similar onset and efficacy to morphine, while producing fewer adverse effects *(11)*. However, surgeons may be worried about the effects of these drugs on bleeding and renal function.

In the absence of patient control it is the nurses who are responsible for the assessment of pain, the delivery of analgesia, and the assessment of outcome. Their attitudes are often distorted by misconceptions about respiratory depression and addiction. In most cases the junior doctors are responsible for changing analgesic prescriptions but they are impeded by inherited myths, traditions, and misconceptions. Of various patient groups it is children, infants and neonates who are most overlooked with sometimes callous disregard. Topical and regional local anaesthetics, including continuous plexus infusions and intravenous opioid infusions offer effective control in paediatric practice *(12)*.

There are surgical considerations as well; for example, the duration of surgery may be an important determinant of pain intensity, and there is a suggestion that cutting diathermy is kinder than the scalpel. The precise interaction of psychological factors and postoperative pain remains uncertain but there is a positive influence of preparatory psychological procedures on outcome *(13)*. Information and explanation are readily administered by the surgeon.

The complex nature of pain and the need for individualisation of management demand new initiatives, and the Working Party on Pain after Surgery *(14)* has recommended the formation of acute pain services. The concept was pioneered in the USA and has been successfully introduced into British hospital practice *(15)*. Such initiative has resource and staff implications, but economic justification can be found in the reduced morbidity, faster convalescence, and improved satisfaction in patients who receive adequate relief of postoperative pain. As we begin to understand the pathophysiology of acute pain so we must use this knowledge to improve the delivery of pain control to the patient.

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