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Dev Anesthetics Pain Manag

Postoperative Pain Management

Thamilselvam P[1]* and Pandurangan T[2]

[1]*Department of Surgery, National defence University of Malaysia, Malaysia*

[2]*Department of Surgery, AIMST University, Malaysia*

***Corresponding author:** Thamilselvam P, Department of Surgery, National defence University of Malaysia, Malaysia*

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Abstract

Pain is an unpleasant and sometime unbearable experience which can produce changes in all the systems of the body. Postoperative pain is both distressing and detrimental for the patient. The management of postoperative pain involves assessment of the pain in terms of intensity at rest and activity associated pain, treatment by pharmacological and non pharmacological means as well as monitoring induced side-effects. The pain would cause the patient to remain in bed and immobile, thus it would lead to DVT, pulmonary atelectasis, muscle wasting, bedsores, urinary retention and some psychological disorders. There are much analgesia which includes opioids and non-opioids. These can be delivered through many routes, neuraxial use of local anaesthetics, nerve blocks, and techniques such as patient controlled analgesia and pre-emptive analgesia have greatly improved the efficacy of pain-control while minimizing the side-effects of any one type. We focus the area of causes of pain and its management.

Keywords: Pain, Management, Post operative and Analgesics

Introduction

The management of post operative pain is a challenge one for the surgeons and anaesthetists. The American Society of Anaesthesiologist practice guidelines said about acute pain management in the preoperative setting, that acute pain is defined as pain present in a surgical patient after some surgical procedure [1]. The World Health Organization and International Association for the Study of Pain have recognized pain relief as a human right [2]. The poorly managed postoperative pains would lead to some complications and prolonged rehabilitation [3]. Uncontrolled acute pain may be associated with the development of chronic pain with reduction in quality of life [4]. Some time, the quality of life would go very badly due to severe and chronic pain. The proper medication for pain can lead to minimise duration of inpatient time, reduced hospital costs, and increased patient satisfaction. As a result, the management of postoperative pain is an increasingly monitored quality measure. The Hospital Consumer Assessment of Health Providers and Systems (HCAHPS) scores measures patient satisfaction with in-hospital pain management and may have implications in regards to reimbursements. The pain management plays very important role as far as the post operative period is concerned [5]. The important postoperative pain control is more particular component when the surgeons deal the care of the surgical patient. Increased morbidity and mortality would be caused by improper management of post-operative pain [6,7]. Many evidence suggests that surgery suppresses the immune system and that this suppression is proportionate to the invasiveness of the surgery [8,9]. The major surgeries which handle the major portion of tissue and organs are directly proportional to post operative pain. There are some reasons for postoperative pain which may lead to chronic pain, including nerve damage, scar tissue formation, tissue damage during surgery, and infections/ inflammation. There are some potential causes of chronic postoperative pain which are psychosocial factors and issues related to the surgery undergone.

The physical reasons of postoperative pain

The nerve damage: Neuropathic pain, or pain caused by nerve physical damage or issues in function, is one of the most common types of chronic postoperative pain. Even though surgeons take more care to avoid nerve injury in intra-operative time, small damages and physical nerve stretching by retractors are sometimes happened.

Nerve injury is usually classified into three types:

i. **Neuropraxia:** Physiologic block of nerve conduction within an axon without any anatomical ninterruption. Here there is no physical and anatomical tissue damage in the nerve tissues.

Example- Saturday night palsy - from falling asleep with one's arm hanging over the arm rest of a chair, compressing the radial nerve.

ii. **Axonotmesis:** Anatomical interruption of the axon with no or only partial interruption of the connective tissue framework. Here there is some physical damage in axis cylinder whereas there may not be no damage in neurilemma -covering sheath of a nerve. It requires regrowth of the axon and it needs some amount of time. This regrowth may be slowed by scar tissue.

Example- Recurrent laryngeal nerve injury during thyroid surgery when the nerve is retracted more with unnecessary stretching .Here the axon gets damaged without surgeon's knowledge since there is no physical damage in nerve coverings.

iii. Neurotmesis: Complete anatomical and physical discontinuity of the nerve of both the axon and all the layers of nerve tissue connective tissue.

Example- Recurrent laryngeal nerve injured during thyroid surgery when the nerve is cut by the surgeon by mistake.

Scar tissue: Scar tissue gets formed when the skin and surrounding tissues heal after surgery or injury. Scar tissue would pull on the surrounding tissues which may compress or irritate nerve endings leading to pain.

Tissue damage: Bone and soft tissues may be damaged or removed during a surgical procedure which would lead to chronic postoperative pain.

Wound inflammation: Prolonged and chronic wound pain is more common after cardiac surgeries and abdominal surgeries. Inflammation surrounding the wound would be the cause for chronic pain.

Some of other causes of post operative pain

The surgeries which are getting operated for longer than three hours would cause chronic postoperative pain. The radiation or chemotherapy treatments soon after surgery may contribute the risk of developing postoperative pain.

Most of preoperative, intra-operative, and postoperative interventions and management strategies are available. These are very important for continuing to evolve for reducing and managing postoperative pain. The American Pain Society (APS), with input from the American Society of Anaesthesiologists (ASA), commissioned a guideline on management of postoperative pain to promote evidence-based, effective, and safer postoperative pain management in children and adults, addressing areas that include preoperative education, perioperative pain management planning, use of different pharmacological and non-pharmacological modalities, organizational policies and procedures, and transition to outpatient care. The ASA published a practice guideline for acute pain management in the preoperative setting in 2012 [10]; the APS has not previously published guidelines on management of postoperative pain. After completion, the guideline was also reviewed for approval by the American Society of Regional Anesthesia and Pain [11]. Good analgesic drugs can reduce severe type of pain. Data available indicate that afferent neural blockade with local anaesthetics is the most effective analgesic technique. Next in order of effectiveness are high-dose opioids, epidural opioids and clonidine, patient controlled opioid therapy, and non-steroidal anti-inflammatory agents [12].

The main advantages of effective postoperative pain management include patient comfort and therefore satisfaction, earlier mobilization, fewer pulmonary and cardiac complications, a reduced risk of deep vein thrombosis, faster recovery with less likelihood of the development of neuropathic pain, and reduced cost of carealso. The failure to provide good postoperative analgesia is multi-factorial. Insufficient education, fear of complications associated with analgesic drugs, poor pain assessment, and inadequate staffing are among its causes [13].

The recent advances of pharmacology for surgical patients regarding pain.

Local anaesthetics medicine: To effectively respond to the issue of sending the ambulatory patient home in a pain-free state, one has to have methods to provide several days of effective and safe relief of moderate to severe pain for the unmonitored patients at home. It is said that local anaesthetic techniques, mainly peripheral nerve blockade, is very important for postoperative pain management [14].

Topical Anaesthesia: Many numbers of new local anaesthetic drugs and methods was identified which may not require the injection into the skin for their anaesthetic effects. Eutectic Mixture of Local Anaesthetics (EMLA) is an example of mixture of lignocaine and prilocaine which effectively reduces the pain of venepuncture as well as other needle stick procedures especially in young children [15,16]. Iontophoresis is another technique which uses an electrical field to drive local anaesthetic drugs in their charged ionic form across the stratum corneum. This technique can provide analgesia to the deeper levels with shorter onset time and is usually well tolerated [17]. Local anaesthetics dispersed in liposomes have been used for transcutaneous anaesthesia providing effective analgesia with shorter application times [18].

There are basically two over arching approaches for prolongation of local anaesthetic action. One is the use of novel delivery techniques for existing drugs. In an endeavor to "make old drugs new" [19], liposome or polymer encapsulation of local anaesthetics are being formulated. The second approach is the development of novel, extremely long-acting local anaesthetics. Liposomes are microscopic phospholipid-bilayered vesicles that are biocompatible, biodegradable, and non-immunogenic. Recently, substantial interest has been shown in developing drug delivery systems utilizing nano-particles, micro-particles composed of biodegradable polymers. They have some advantages over liposomes in terms of stability both during storage and in vivo. To date, many local anaesthetics (most commonly bupivacaine, but also mepivacaine, ropivacaine, lidocaine, prilocaine, etc.) have been loaded in liposomes or polymer microspheres [20,21]. It is hoped that in the near future, some of these formulations will become a part of the pain clinician's armamentarium. However, the road toward achieving this goal may be long and winding, due to problems of these drug delivery systems, such as shelf life, aggregation, leakage, and toxicity [22]. A recent review highlights current advances in our understanding of the role perioperative NSAIDs have on modulating nociception, their benefits when utilized as components of a multimodal analgesic regimen, and potential deleterious cardiovascular and estrogenic effects. Recent

research indicates that, in addition to peripheral blockade of prostaglandin synthesis, central inhibition of cyclooxygenase-2 may play an important role in modulating nociception. Although nonspecific NSAIDs provide analgesic efficacy similar to coxibs, their use has been limited in the preoperative setting because of platelet dysfunction and gastrointestinal toxicity. Coxibs may be a safer alternative in that setting. Both coxibs and traditional NSAIDs may contribute to a dose-dependent increase in cardiovascular toxicity and impaired osteogenesis. When used short term at the lowest effective dose, however, NSAIDs may provide for analgesic benefit without significant toxicity [23].

Conclusion

Though we have number drugs to relive pain to the patients, we need to choose the proper drugs according to the patient's disease. The physician has to know the anatomy and physiology of nerve and its distribution. The physician has to have adequate knowledge about pharmacotherapy with their side effects. The organizational issues include a demand for improved collaboration on the pain issue between anaesthesiologists, the acute pain service, surgeons and surgical nurses to provide full benefit to the patients.

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