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Multimodal Therapy for Postoperative Pain Management

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Best Practice for Pain Control

Topic: Multimodal therapy works best to control postoperative pain safely. Multimodal pain treatment involves the use of two or more classes of analgesics to target different pain mechanisms.

Why? Data is present that supports that health care systems are still under treating pain in the postoperative patient. Unrelieved pain has harmful effects to multiple body systems. There is still a need to provide education to providers, nurses and patients to promote best practice in pain management approaches regarding multimodal therapy.

Opiate analgesics still remain the most commonly used treatment for pain following surgery. Using this singular analgesic modality could put patients at risk for hypoxemia, as respiratory depression is the most dangerous of opioid side effects (Hartrick, 2004). In addition, patients can still have uncontrolled pain on this single analgesic regimen for pain management. Evidence points to multimodal therapy consisting of rational combination of analgesics with different underlying mechanisms that help to achieve the greatest pain relief.

The use of the multimodal approach allows for lower doses of each drug and therefore has the potential to minimize adverse effects. Maximizing pain relief while preventing gaps in analgesia is the goal to prevent worsening pain. Using drug therapy to target both inflammatory and neuropathic pain in the setting of postoperative pain can prove to be opioid sparing.

Multimodal and preemptive therapies to prevent postoperative pain have improved by recent advances in the understanding of how undertreated acute pain can lead to chronic pain. Also, more attention has been placed on the role of local inflammation occurring at the injured tissue site. This inflammatory process increases the sensitivity of nociceptors. This prompted the adding of non-steroidal anti-inflammatory drugs to preventively control postoperative pain. Blocking pain signals by a variety of methods has improved postoperative pain management and the patient benefits from all these measures (Cornwell, 2013).



Implications for Nursing Care

Nurses can advocate for their patients with unrelieved postoperative pain that are on a single analgesic agent. The nurse can accomplish this by promoting multimodal therapy such as adding non-opioid medication to help control pain safely.

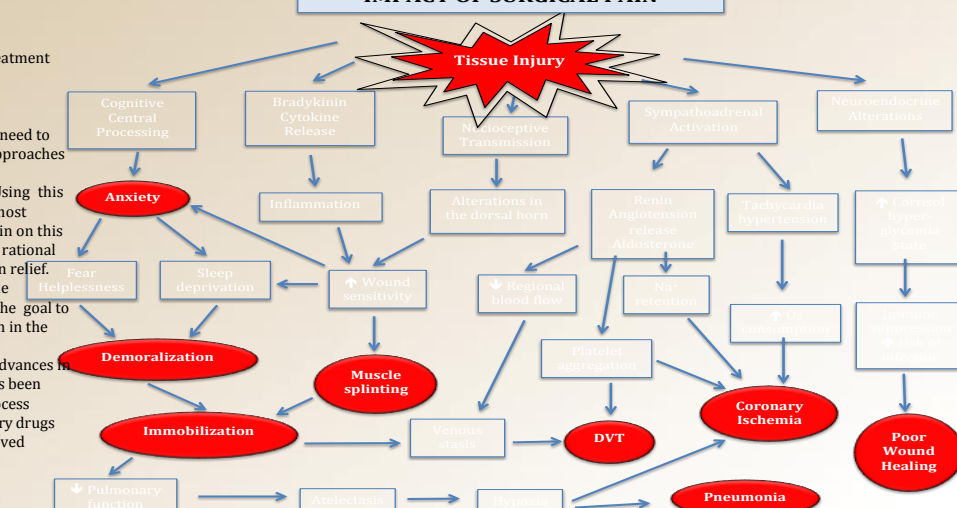
Hospitals can promote better postoperative care in general by adding multimodal therapy to standards of care of the postoperative patient as well as for chronic pain, other types of acute pain and palliative pain scenarios.

Systems that develop protocols for using the multimodal approach for postoperative pain management will impact patient satisfaction and promote patient safety. Adopting these methods of multimodal therapy for pain relief has also shown to improve cost savings when compared to traditional practices (Parvizi & Bloomfield, 2013).

The studies have shown that implementing multimodal pain management improves pain relief during hospitalized stay, improves patient satisfaction at discharge, and reduces total opioid consumption after orthopedic surgeries (Kang et al., 2013).

The non-pharmacological aspect to multimodal therapy is very important. Patients should have relaxation therapy available to them pre and postoperatively to help alleviate anxiety and reduce pain throughout their hospital stay. In addition to less pain and anxiety, these patients also benefit from lowered blood pressure and promotion of sleep (Lin, 2012). Hospitals should promote complementary therapy programs to assist patients in their recovery by offering various relaxation therapies to reduce stress and pain. Nursing can take the lead in providing these non-pharmacologic therapies at the bedside.

IMPACT OF SURGICAL PAIN



Adapted from Sinatra, R., Hord, A., Ginsberg, B., Preble, L., 1992.

Pain Management Therapy Options

Acetaminophen

HOW? Inhibits prostaglandins centrally, also affects on neurotransmitter receptors N-methyl-D-aspartate and substance P. No effect on COX or platelet function.
EFFECT? Provides pain relief.

NSAIDs

HOW? Inhibits prostaglandin production from arachidonic acid by cyclooxygenase (COX 1 and COX 2), has peripheral and central effects.
EFFECT? Provides relief from inflammation and pain.

Opioids

HOW? Binds to opioid receptors (mu, kappa, delta) located in the brain, spinal cord and GI tract.
EFFECT? Alters perception of pain, euphoria, decreases GI function, and respiratory depression.

Skeletal muscle relaxers

HOW? Inhibits neurotransmitters release, centrally acting, the exact mechanism unclear.
EFFECT? Pain relief obtained from muscle spasm.

Cyclical anti depressants

HOW? Combined norepinephrine and serotonin reuptake inhibition in inhibitory descending pathways. Also blocks Na⁺ channels, and muscarinic acetylcholine receptor antagonist.
EFFECT? Provides analgesia or pain relief.

Relaxation response

HOW? Inhibits the "fight or flight response" and decreases epinephrine, norepinephrine, & decrease cortisol.
EFFECT? Decreased stress response, decreased muscle tension, decreased anxiety, decreased blood pressure, improves sleep, and promotes healing.

Anti-convulsants

HOW? Calcium channel blockers (gabapentin and pregabalin) bind to cellular calcium channels and blocks neurotransmitter release such as glutamate, norepinephrine and substance P. This suppresses abnormal discharges from the neurons.

Although structurally similar to GABA, an inhibitory neurotransmitter, gabapentin and pregabalin have no activity at the GABA receptor site.

EFFECT? Provides good opioid sparing effect, can reduce spasticity, provides pain relief, promotes restful sleep and has anti-seizure effects.

Benzodiazepines

HOW? Increase inhibitory GABA transmission.
EFFECT? Reduces motor neuron output, sedation and respiratory depression.

AVOID USE in pain management as all benzodiazepines cause additive sedation with opioids and this dangerous combination should be avoided to prevent respiratory depression. Also physical dependence occurs with prolonged use.

Local anesthetics techniques

HOW? Blocks neuron conduction by blocking Na⁺ channels on internal neuronal membranes. This effect inhibits the necessary action potentials.

EFFECT? Sensation can be abolished in various parts of the body by topicals, injections, or administration into the epidural or subarachnoid space. These actions are reversible, therefore quite useful (Benzon et al., 2010).

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Photograph by K. Lynch, 2009.

Conclusion

In summary of all these concepts, reducing pain postoperatively and controlling the stress response will allow for early and aggressive recovery activities for the patient. Focus on the strategies that will allow for the lowest dosing of opioids and use the non-opioid combinations such as NSAIDs, anticonvulsants, local anesthetics and relaxation techniques. Highlighting that multimodal analgesia will result in greater pain relief than any single analgesic agent. The importance of early initiation of multimodal therapy approaches for persistent postoperative pain (Pasero & McCafferty, 2011).

Pain has multiple underlying pathways and mechanisms and is a multifaceted phenomenon. Research clearly points to the use of multimodal therapy to best control postoperative pain, however the majority of providers do not get the specialized training needed to individualize this best practice for their patients. The importance of using a multimodal approach to manage all types of pain should be the standard not the exception.

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