

PAIN MANAGEMENT FOR HIP SURGERIES

Essay

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List of Abbreviations

Abb.	Full term
5HT	5-hydroxytryptamine receptor
5HT3	5 Hydroxy Tryptaline 3
A2a	Adenosine 2 a receptor
ACLS.....	Advanced Cardiac Life support
ACTH.....	Adrenocorticotropic hormone
ADH	Anti Diuretic Hormone
AHA	American Heart Association
AMPA	α -amino-3-hydroxy-5-methyl-4 isoxazolepropionic acid receptor
ASA	American Society of anesthesia
ASIC	Acid Sensing Ion Channel
B.....	Bradykinin receptor
BBB.....	Blood Brain Barrier
BDNF.....	Brain Derived Neurotrophic Factor
BK.....	Bradykinin
BMI	Body mass index
CB1	Cannabinoid 1
CC2	Chemokine 2
CC3	Chemokine 3
cFNB.....	Continuous femoral nerve block
CGRP	Calcitonin Gene Related Peptide
cLPB	Continuous lumbar plexus block
CNS.....	Central Nervous System
COX 1	Cyclooxygenase

List of Abbreviations (Cont...)

Abb.	Full term
CPNB.....	Continuous peripheral nerve block
CPSP.....	Chronic post surgical pain
CSA.....	Continuous spinal Anesthesia
CSF.....	Cerebro Spinal Fluid
CV.....	Cardio vascular
CYP3A4	Cytochrome P450 3A4
DOR.....	Delta Opioid Receptor
DRASIC	Dorsal root ganglion acid sensitive channel
DRG.....	Dorsal Root Ganglia
DVT.....	Deep Vein Thrombosis
EP.....	E prostanoïd receptors
EREM	Extended Release Epidural Morphine
ERP.....	Enhanced recovery program
FDA.....	Food & Drug Administration
FFA.....	Free Fatty Acids
FIAU	Fast-track arthroplasty unit
FNB	Femoral nerve block
GA.....	General anesthesia
GABA.....	Gamma amino butyric acid
GI.....	Gastro Intestinal
H1	Histamine
H3G.....	Hydro morphine 3 glucuronide

List of Abbreviations (Cont...)

Abb.	Full term
HA.....	Histamine
Hb	Heamoglobin
IASP.....	International Association of Study of Pain
ICU	Intensive care unit
iGluR.....	Ionotropic glutamate receptor
IL10.....	Interleukin 10
IL1B.....	Interleukin 1B
IL6.....	Interleukin 6
IM.....	Intra Muscular
IP.....	Prostaglandin I receptor
ITS	Iontophoretic transdermal system
IV	Intra Venous
KOR	Kappa Opioid Receptor
LA	Local Anesthetic
LIA.....	Local infiltration analgesia
LOS.....	Length of stay
LP.....	Lumbar Plexus
LPB.....	Lumbar Plexus Block
LPT	Long term potentiation
M1	Desmethyl tramal
M3G	Morphine 3 glucuronide
M6G	Morphine 6 glucuronide
MAM.....	Mono Acetyl Morphine

List of Abbreviations (Cont...)

Abb.	Full term
mGluR	Metabotropic glutamate receptor
MIS	Minimally invasive surgery
MOR.....	Moe Opioid Receptor
NERP	Norwich Enhanced Recovery Programme
NK.....	Neurokinin
NLC	Nucleus Locus Coeruleus
NMDA.....	N-methyl-D-aspartate receptor
NMES	Neuromuscular electrical stimulation
NO.....	Nitric Oxide
NRS.....	Numerical Rating Scale
NSAIDs.....	Non steroid anti inflammatory drugs
nsNSAID.....	Non selective non steroid anti inflammatory drug
ORADEs	Opioid related adverse effects
PAG.....	Peri Aqueductal Gray
PAR.....	Proteinase-activated receptor
PCA.....	Patient controlled analgesia
PCB.....	Psoas compartment block
PCEA	Patient controlled epidural analgesia
PCSNB.....	Psoas compartment sacral nerve block
PDPH.....	Post dural puncture headache

List of Abbreviations (Cont...)

Abb.	Full term
PEMF.....	Pulsed electromagnetic fields
PGE2.....	Prostaglandin E2
PGH	Prostaglandin endoperoxide
PGI2.....	Prostaglandin I2
PMDI	Periarticular Multimodal Drug Injection
PNB	Peripheral nerve block
POCD.....	Post Operative cognitive dysfunction
PONV.....	Post Operative Nausea and Vomiting
RA	Regional anasethia
RCT.....	Randomized clinical trial
RVM.....	Rostro Ventro Medial
SCN9A.....	Sodium channel, voltage gated, type IX alpha subunit
THA	Total hip arthroplasty
TJA	Total joint Arthroplasty
TNF.....	Tumor Necrosis Factor
TNS.....	Transient neurological syndrome
TRP	Transient Receptor Potential
TRPV1	Transient receptor potential vanilloid
VAS.....	Visual Analogue Scale
VDS.....	Verbal Descriptor Scale

Abstract

Therefore, if patients are not given good postoperative pain management they have an increased risk of chest infections, hypoxia and cardiac problems, pressure sores, deep vein thrombosis, depression, anxiety, anorexia, increased wound infection rates, etc. Anaesthesia for total hip and knee arthroplasty should provide stable intra-operative conditions and allow rapid patient recovery. Analgesic techniques should aim to provide optimal pain relief whilst minimizing side effects such as sedation, PONV, hypotension, and motor block. There is now good evidence that well-conducted regional analgesia can achieve these aims, leading to improved functional recovery facilitated by more rapid and effective joint rehabilitation. Opioids remain the mainstay of systemic analgesia for the treatment of moderate to severe acute pain. After operative fracture treatment, patients who take more opioids report greater pain intensity and less satisfaction with pain relief. Greater self-efficacy was the best determinant of satisfaction with pain relief. Evidence-based interventions to increase self-efficacy merit additional study for the management of postoperative pain during recovery from a fracture. Morphine remains the most widely used opioid for the management of pain and the standard against which other opioids are compared. The consistent efficacy of epidural analgesia has been well demonstrated. Regardless of analgesic agent used, location of catheter, type of surgery and type or time of pain assessment, it provided better pain relief than parenteral opioid administration.

Keywords: Pain Management; Hip Surgeries

INTRODUCTION

The International Association for the study of pain has defined pain as an unpleasant sensory and emotional experiences associated with actual or potential tissue damage (*IASP Taxonomy Definitions, 2012*).

Although acute or nociceptive pain is distinct from chronic pain, the boundaries are not well defined. Patients with acute pain usually experience resolution, whereas patients with chronic pain are unlikely to do so. Remember, that although acute pain has a foreseeable end it's management should be a high priority because acute pain may, when neglected, become chronic and persistent. While most patients experience nociceptive pain (that follows normal pain pathways), some may also experience neuropathic pain (nerve damage pain) (*Gray, 2008*).

The goal in postoperative pain management is to mobilize the person as early as possible, get them eating and drinking as early as appropriate and ensure they are able to cough and deep breathe. Therefore, if patients are not given good postoperative pain management they have an increased risk of chest infections, hypoxia and cardiac problems, pressure sores, deep vein thrombosis, depression, anxiety, anorexia, increased wound infection rates, etc (*Buvanendran et al., 2003*).

According to Woolf, there are three classes of pain: nociceptive pain, inflammatory pain which is associated with tissue damage and the infiltration of immune cells, and pathological pain which is a disease state caused by damage to the nervous system (neuropathic pain) or by its abnormal function (*Woolf, 2010*).

Traditional methods of treating pain following total joint arthroplasty involve postoperative oral narcotic pain medications and intravenous patient-controlled analgesia. But such opioid use is not without side effects, including nausea, vomiting, pruritus, sedation, dizziness, bladder dysfunction, reduced gastrointestinal motility (which may lead to ileus), and sleep pattern disturbance (*Joshi 2005*).

There are several incisions for hip joint surgeries, defined by their relation to the gluteus medius. The approaches are posterior (Moore), lateral (Hardinge or Liverpool), antero-lateral (Watson-Jones), anterior (Smith-Petersen) and greater trochanter osteotomy. There is no compelling evidence in the literature for any particular approach, but consensus of professional opinion favours either modified anterolateral (Watson-Jones) or posterior approach (*Pai, 1997*).

Pre-emptive analgesia, defined as “analgesic intervention provided before surgery to prevent or reduce subsequent pain” attempts to prevent the establishment of central sensitization and therefore reduce pain intensity and decrease analgesic requirements (*Unlugenc et al., 2003*).

AIM OF THE WORK

The aim of this work is to focus in different peri-operative pain management techniques for hip surgery.

POST OPERATIVE PAIN AFTER HIP SURGERY

IASP definition of pain:

The International Association for the Study of Pain's widely used definition states: "Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage." (*the international association of the study of pain Last Updated: May 22, 2012*).

Pain perception and nociceptive pathways

The neural processes underlying the encoding and processing of noxious stimuli are defined as 'nociception'. In addition to these sensory effects, the perception and subjective experience of 'pain' is multifactorial and will be influenced by psychological and environmental factors in every individual (*Zheng et al., 2015*).

Peripheral nociceptors

The detection of noxious stimuli requires activation of peripheral sensory organs (nociceptors) and transduction into action potentials for conduction to the central nervous system. Nociceptive afferents are widely distributed throughout the body (skin, muscle, joints, viscera, meninges) and comprise both medium-diameter lightly myelinated A-delta fibres and