بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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Continuous Femoral Nerve Blockade versus Continuous Epidural Analgesia for Postoperative Pain Relief in Knee Surgeries

Thesis

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List of Abbreviations

Abb.	Full term

ACB .....Adductor canal block

ASRA .....American Society for Regional Anesthesia

CEA ..... Continuous epidural analegesia

CFNB ..... Continuous femoral nerve block

CVS .....Cardiovascular system

IV .....Intravenous

MAPK .....Mitogen - activated protein kinase

NSAIDs .....Non-steroidal anti-inflammatory drugs

OA .....Osteoarthritis

OR .....Operating room

PACU .....Postanaesthesia care unit

PCA .....Patient-controlled analgesia

PI3K .....Phosphoinositide 3 - kinase

PNBs .....Peripheral nerve blocks

TKA .....Total knee arthroplasty

TKR .....Total Knee Replacement

VAS .....Visual Analogue Scale

VF .....Ventricular fibrillation

VGSC .....Voltage - gated sodium channel

VT .....Ventricular tachycardia

INTRODUCTION

The progression of osteoarthritis is characteristically slow, occurring over several years or decades. Over this period, the patient can become less and less active and thus more susceptible to morbidities related to decreasing physical activity including Potential Weight Gain.

Early in the disease process, the joints may appear normal. However, the patient's gait may be antalgic if weight-bearing joints are involved.

Pain is usually the initial source of morbidity in osteoarthritis, with the disease's primary symptom being deep, achy joint pain exacerbated by extensive use. Also, reduced range of motion and crepitus are frequently present. Stiffness during rest (gelling) may develop, with morning joint stiffness usually lasting for less than 30 minutes ***(Lozada, 2020).***

Osteoarthritis (OA) is the most common form of arthritis accounting for about 30% of general physician visits ***(Kramer et al., 1983).*** It may be defined as a heterogeneous group of conditions that lead to joint symptoms and signs which are associated with defective integrity of articular cartilage, in addition to related changes in the underlying bone and at the joint margins ***(Altman et al., 1986).*** It is usually classified as either primary (idiopathic) or secondary associated with a known condition. Although OA is present by histologic or

radiographic criteria in nearly 80.0% of people by the age of 80 years, only half have symptoms ***(Hochberg et al., 1989)*** and these are often variable and intermittent. There is a modest correlation between the presence of symptoms and the severity of anatomic changes ***(Islam et al., 2013).***

Total knee arthroplasty (TKA) is a viable treatment for symptomatic osteoarthritis of the knee refractory to conservative measures. In those with endstage degenerative changes compromising the articular cartilage affecting multiple compartments of the knee, the literature has yet to identify a potentially viable alternative option for the regeneration of cartilage. Thus, TKA has demonstrated reproducible, longterm, successful results in such patients concerning outcomes of decreased pain and improved overall quality of life ***(Gemayel and Varacallo, 2019).***

Regional anesthesia refers to the focused delivery of anesthetic agent(s) to a given part of the body. Regional anesthesia is used extensively for various purposes, including as a primary anesthetic technique for surgery, as an analgesic modality to manage pain in the perioperative period, and as an analgesic modality for various other forms of acute and/or chronic pain ***(Hopcian, 2009).***

Femoral nerve block (FNB), epidural block and intravenous patient-controlled analgesia (PCA) are commonly used analgesic options for TKA. PCA of opioids are the primary analgesic for TKA. However, opioids are associated

with side effects which might have negative effects on patient comfort and delaying the start of physiotherapy. Epidural analgesia provides better pain relief. There are, however, many side effects such as perioperative hypotension, urinary retention and respiratory depression. FNB is now the most admired method of analgesia for TKA. It is accurate under the guidance of ultrasound and has a low risk of complications ***(Yi et al., 2017).***

AIM OF THE WORK

Compare the benefits of continuous femoral nerve block (CFNB) with those of continuous epidural analgesia CEPA for postoperative pain management after Knee surgeries.

Chapter 1

EPIDURAL ANAELGEISA, ANATOMY & PROCEDURE

Epidural analgesia

Epidural analgesia refers to the delivery of anesthetics to the epidural space for purposes of pain control. Commonly used agents include opioids and local anesthetics. Opioids can be administered by bolus or infusion. Epidural local anesthetics, typically diluted solutions of bupivacaine or ropivacaine, are typically administered by infusion. Adverse effects of epidural local anesthetics include urinary retention, motor blockade (i.e., weakness), and a sympathectomy-mediated decrease in blood pressure. Epidural local anesthetics and opioids are frequently combined in lower dosages to decrease the risk of each drug's associated adverse effects ***(Hopcian, 2009).***

The duration of epidural infusion depends on several factors. To varying degrees depending on drug-concentration and patient characteristics, epidural infusions may complicate patient mobility, voiding, and rehabilitation therapy. Additionally, the infectious risks for epidural catheters is thought to increase with time. Generally speaking, epidural catheters are removed within a matter of days to minimize microbial colonization of indwelling catheters. Moreover, the

risk of epidural hematoma increases in the presence of anticoagulants and drugs known to affect hemostasis (i.e., non-steroidal anti-inflammatory drugs [NSAIDs]). Use of such drugs are not contraindicated per se, but must be used with caution, ideally aligned with practice guidelines such as those published by the American Society for Regional Anesthesia (ASRA) ***(Hopcian, 2009).***

A wide variety of dosing regimens for regional anesthesia are in use. Opioid and local anesthetic drugs can be combined in the same infusion. Intravenous (IV) PCA opioid can be administered as an adjunct to local anesthetic infusions.

Some common examples of epidural infusion components include:

- Morphine (0.01%) – 5–10 mL/h
- Fentanyl (0.001%) – 5–10 mL/h
- Hydromorphone (0.005%) – 5–10 mL/h
- Bupivacaine (0.05-0.1%) – 5–10 mL/h
- Ropivacaine (0.1%) – 5–10 mL/h

It should be noted that the interplay and additive effect of neuraxial and IV opioids is difficult to fully predict. For this reason, practitioners may consider pure local anesthetic epidural solution when frequent dosing of adjuvant IV opioid (i.e., opioid PCA) will be used.