Preoperative Infiltration Analgesia Prior to Cesarean Section

Thesis
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By

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List of Abbreviations

5-HT : Serotonin

ACh : Acetylcholine

ACLS : Advanced cardiac life support

AMPA : 2-amino-3- hydroxy-5-methyl-4-isoxazole-propionic acid

APS : Acute pain service

ATP : Adenosine triphosphate

cAMP : Cyclic adenosine monophosphate.

CNS : Central nervous system

COX-1 : Cyclooxygenase 1

COX-2 : Cyclooxygenase 2

CPNB : Continuous peripheral nerve block

CYP : Cytochrome P450,

DOP : Delta (Δ) opioid peptide

DRG : Dorsal root ganglion

GABA : Gamma-Aminobutyric acid

KOP : Kappa (K) -opioid peptide

LA : Local anesthetics

MHRA : Medicines and Healthcare products Regulatory Agency

MOP : Mu (M) opioid peptide

NMDA : N-methyl-D-aspartate

NMDA : N-Methyl-D-aspartic acid

NOP : Nociceptin receptor

NPSA : National Patient Safety Agency
NS : Nociceptive-specific
NSAIDs : Non-steroidal antiinflammatory drugs
OTC : Over-the-counter
PABA : Para-aminobenzoic acid
PAG : Periaqueductal grey
PCA : Aspatient-controlled analgesia
PONV : Postoperative nausea and vomiting
TENS : Transcutaneous electrical nerve stimulation
TRP : Transient receptor potential
VAS : Visual Analogue Scale
VSCC : Voltage sensitive calcium channels
WDR : Wide-dynamic-range
WHO : World Health Organization

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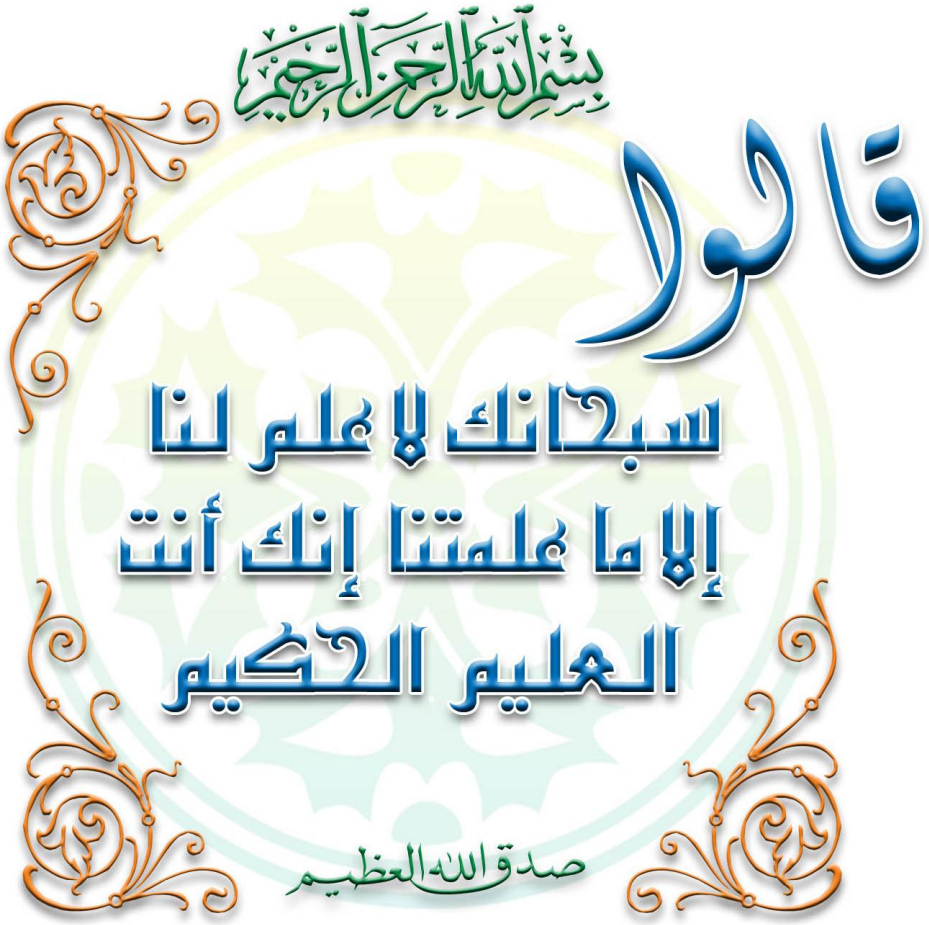
Last but not least, I have to dedicate this work to ***my family,*** *who are supportive to me all the time.*

Ahmed Mohammed Salah

Dedication

I would like to dedicate this thesis to the soul of my Great ***Father,*** *for him I will never find adequate words to express my gratitude.*



سورة البقرة الآية: ٣٢

Introduction

Delivery by caesarean section (CS) is becoming more frequent and is one of the most common major operative procedure performed worldwide. In the USA a CS rate of 26% for all births is reported. The rate approaches 25% in Canada and is over 20% in England, Wales and Northern Ireland **(CDC, 2006 and RCOG, 2001).**

Childbirth is an emotional experience for a woman and her family. The mother needs to bond with the new baby as early as possible and initiate early breastfeeding, which helps to contract the uterus and accelerates the process of uterine involution in the postpartum period **(Novy, 1991).**

So Achieving optimal pain relief after cesarean delivery is an important issue due to a higher risk for thromboembolic events, because of the surgery and the hypercoagulable state of pregnancy and puerperium. In addition, these patients are highly motivated and desire early ambulation in order to breastfeed and care for their newborn **(Roy Kessous et al., 2011).**

The degree of postoperative pain, as ultimately perceived by the patient, is multifactorial and depends on variables such as type and duration of the operation, type of anesthesia and operation, type of anesthesia and analgesia used, and the patient's mental and emotional status (for example: laparotomy for cesarean delivery versus laparotomy for uterine cancer **(Pan et al., 2006).**

There are many methods of postoperative pain treatment. The traditional and most widely used is parenteral opioids. Parenteral narcotics in general are associated with nausea, vomiting, constipation, respiratory depression, and sedation. Newer technologies, such as continuous epidural analgesia or patientcontrolled analgesia, have adverse effects, are expensive, and require trained personnel and special equipment another option for postcesarean pain management is to administer oral analgesics immediately after the procedure **(Faboyaa and Unclesb, 2007; Cohen and Smetzer, 2005 and Jakobi et al., 2000).**

Preemptive analgesia is an analgesic regimen initiated before the onset of tissue trauma and could have effects that outlast the pharmacokinetic presence of the intervention and its efficacy. It is based on the theory of prevention of central pain sensitization. Different techniques of preemptive analgesia have been reported, including intramuscular, intravenous, epidural, and local anesthetics used in peripheral nerve block, intraperitoneal instillation, or wound Infiltration **(Moiniche et al., 2002 and Kaufman et al., 2005).**

Several studies have reported on use of pre-emptive local anaesthetics (local anaesthetic given during the operation to prevent or reduce pain afterwards) to relieve postoperative pain, with results ranging from being beneficial **(Leila Sekhavat, 2011; Ganta et al., 1994 and Johanssen et al., 1997)** to conferring no benefit **(Roy Kessous, 2011; Adams et al., 1991 and Friedman et al., 2000).**

Pain

Introduction:

Pain often occurs in critical care patients and is one of the most clinically challenging problems for critical care nurses. Pain and discomfort in these patients can be due to surgical and posttraumatic, invasive monitoring devices, prolonged immobilization, mechanical ventilation, and routine nursing procedures such as suctioning and dressing changes **(Jodka and Heard, 2005).**

In addition, patients may have a preexisting chronic pain condition, complicating the assessment and treatment of acute pain. Pain is a problem in critical care that has not been adequately addressed. Strategies for changing pain management practices include providing documentation, implementing pain guidelines, using algorithms and increasing education in pain management for acute and critical care nurses. A review of pain physiology is essential to fully understand the principles of pain management **(Shannon and Bucknall, 2003).**

Defining pain:

McCaffery (1972) defined pain as 'whatever the experiencing person says it is, and exists whenever he says it does'. The International Association for the Study of Pain provides a comprehensive definition of pain as 'an unpleasant

sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. Pain is an individual experience and a complex phenomenon influenced by biological, psychological and social factors **(Merskey and Bogduk, 1994).**

Evolution of Pain Theories:

As early as 1644, Descartes proposed a theory of pain, that a straightline channel of pain exists from skin to brain **(Melzack, 1973).**

During the 19th century, von Frey theorized that pain pathways move from specialized receptors in body tissues to a pain center in the brain. The focus of this theory, known as the specificity theory, is specialized peripheral receptors rather than a central mechanism of pain in the brain. However, although receptors are specialized, a focus on peripheral receptors does not explain how an amputee can feel pain in the amputated limb (aphenomenon known as phantom limb pain) when the peripheral receptors no longer exist. According to the pattern theory of pain proposed in the late 19^{th} century, pain is the result of stimulation of certain nerve impulses that form a pattern and are then combined and dumped into the spinal cord as a lump sum of pain, a process called "central summation **(Melzack, 1973).**

This theory can better account for the phantom limb phenomenon, because the focus is on what occurs in the brain