Comparison Between The Effect Of Wound Infiltration With Bupivacaine Versus Pethidine For Post Cesarean Section Pain Relief: A Randomized Controlled Trial

A thesis

Submitted for partial fulfillment of Master Degree
In Obstetrics and Gynecology

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2017

سورة البقرة الآية: ٣٢

Acknowledgments

First of all; thanks to ***Allah*** *Who granted me the ability to perform this work.*

I wish to express my gratitude and respect to **Prof. Dr. Gehan Allam Hamed,** *Professor of Obstetrics and Gynecology Faculty of Medicine-Ain Shams University for her care, friendly encouragement and endless support. Thanks for always being a mother and guidance before being a teacher.*

I would like to express my sincere gratitude to **Prof. Dr. Mohamed El-Mandooh Mohamed,** *Professor of Obstetrics and Gynecology Faculty of Medicine-Ain Shams University for his scientific guidance and valuable support in this work. He enriched this work by his valuable knowledge.*

I am deeply grateful to **Dr. Waleed Mohamed Khalaf,** *Lecturer in Obstetrics and Gynecology Faculty of Medicine-Ain Shams University for his significant effort in enriching this work by his continuous instructions.*

Finally, I should thank my ***Mother****, my* ***Father*** *and my* ***Husband*** *for their endless support. They are always behind all successful aspects of my life.*

Samia Mohamed Saber Mansour

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List of Abbreviations

Abbr.	Full-term
ASIS	Anterior superior iliac spine
Ca^{2+}	Calcium
cAMP	Cyclic adenosinemonophosphate
CNS	Central nervous system
CPSP	Chronic post surgical pain
CRI	Constant rate infusion
CS	Cesarean section
CVS	Cardiovascular system
Hrs	Hours
IL	Interleukin
IM	Intra muscular
IV	Intra venous
K^+	Postassium ion
LA	Local aneasthesia
Na^+	Sodium ion
$NSAID_S$	Non – steroidal anti – inflammatory analgesics
PABA	Para amino benzoicacid
PAG	Per-Aqueductal Gray
PH	Power of hydrogen
PKa	Acid dissociation constant
PONV	Post – operative nausea and vomiting
RCT	Randomized controlled trial
SMT	Spinomesencephalic tract
SP	Substance p.
SRT	Spinoreticular tract
STT	Spinothacamic tract
VAS	Visual analogue scale
VDS	Verbal descriptor scale
VMM	Ventromedian medulla
VNRS	Verbal numerical rating scales

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ABSTRACT

Objectives:

To compare between the effect of wound infiltration with bupivacaine versus pethidine for post cesarean section pain relief.

Patients and methods:

A randomized controlled trial was designed to compare between the effect of subrectal and subcutaneous infiltration with 20 ml 0.25 % Bupivacaine versus 50 mg pethidine diluted in 20 ml normal saline.

One hundred full term pregnant females randomized into two groups:-

- **Group A** (50 patients) ---- > Bupivacaine group.
- **Group B** (50 patients) ---- >Pethidine group.

All patients had C.S under spinal anesthesia and received post-operative analgesia in the form of IV paracetamol according to the value of the visual analogue scale. The total amount of analgesia used was assessed at 4, 8, 12 and 24 hours at rest and on coughing.

Frist time request analgesia and time of ambulation were assessed.

Results:

- The infiltration of the surgical wound of a cesarean section with Pethidine after spinal anesthesia provided a significant degree of analgesia as shown by the smaller pain score and decreased total analgesic consumption compared with bupivacaine.
- The use of Pethidine local anesthetic infiltration of wound of cesarean section provides prolonged pain free duration and early ambulation.
- No significant difference between Bupivacaine and pethidine regarding side effects or complications.

Conclusion:

Infiltration of the wound of cesarean section with Pethidine gives effective analgesia for several hours, decreased systemic analgesic consumption, decreased patients ambulation time and prolonged first time request analgesia as compared to Bupivacaine.

Recommendations:

We recommend using local Pethidine anesthesia as analgesic in subrectal and subcutaneous infiltration of cesarean section wound as it decreases pain, prolongs pain free duration, reduces consumption of analgesics post-operatively, provides earlier ambulation and decrease side effects and complications.

Key words: wound infiltration, Bupivacaine, Pethidine post cesarean section, pain relief, subrectal & subcutaneous infiltration

Introduction

Delivery by cesarean section (CS) is becoming more frequent and it is one of the most common major operative procedures performed all over the world. In the USA a cesarean section rate of 26% for all births is reported. In Egypt, a significant rise in cesarean deliveries occurred for all births, from a low of 4.6% in 1992 to 23% in 2000; however hospital-based cesarean section were much higher in 1987-1988 about 13.9% increasing to 22% in 1999-2000 ***(Khawaja et al., 2004).***

Childbirth is an emotional experience for the woman and her family. The mother needs to bond with her baby as early as possible and initiates early breastfeeding, which helps to contract the uterus and accelerates uterine involution process in the postpartum period. Any intervention that leads to pain relief can positively impact on early breastfeeding. Prompt and adequate postoperative relief of pain is therefore an important component of cesarean delivery which can make the duration immediately after the operation less uncomfortable and more emotionally gratifying. Postoperative pain after cesarean section is usually managed with opioids in combination with other forms of analgesics ***(Novy, 1991).***

Cesarean section is performed under general anesthesia, spinal anesthesia, combined spinal epidural or epidural block.

Local anesthesia has been employed in the operation as an adjuvant to anesthesia or to decrease postoperative pain.

Local anesthetic is injected to block the nerves before cutting the skin at the beginning of the operation, or after closing the skin at the end ***(Trotter et al., 1991).***

Subcutaneous infiltration of bupivacaine microcapsules prolongs analgesia in humans for up to 96 h ***(Kucuk et al., 2007),*** and presurgical infiltration of levobupivacaine significantly decreases the intensity of postsurgical pain, especially for the first 12 h, thereby reducing analgesic consumption ***(Ranta PO. et al., 2006).***

Wound infiltration achieved analgesia and patient satisfaction comparable with epidural analgesia ***(Kushner et al., 2005).***

Incisional infiltration with local anesthetics is a simple, inexpensive and effective mean of providing good analgesia for a variety of surgical operations without any major side-effects. In particular, local anesthetic toxicity, wound infection and healing do not appear to be major considerations. Postoperative analgesia is a main component of peri-operative care and local anesthetic (LA) techniques are more effective than systemic analgesia regardless the operation and mode of delivery ***(Wu et al., 2005).***

By allowing patients to mobilize more quickly, incisional infiltration may be effective as central and proximal peripheral blocks in providing a safe postoperative recovery. Although untreated postsurgical pain can cause chronic pain ***(Kehlet et al., 2006).***

Aim of the Work

The aim of this study is to assess the effect of local anesthetic agent incisional infiltration on pain relief after C.S and its side-effects.

Chapter (1)
Anatomy and physiology of pain

I. Definition:

Pain is a distressing feeling often caused by intense or damaging stimuli, such as stubbing a toe, burning a finger, putting alcohol on a cut, and bumping the "funny bone", Because it is a complex subjective phenomenon, defining pain has been a challenge, Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage ***(International Association for the Study of Pain, 2015).***

II. Terminology:

A. Pain Threshold:

It is the minimum intensity of a stimulus that is perceived as painful ***(IASP Pain Terminology, 2013)***.

B. Pain Tolerance:

Maximum noxious stimulation patient can tolerate ***(Serpell M, 2005)***.

C. Allodynia:

Refers to central pain sensitization (increased response of neurons) following painful, often repetitive, stimulation. Allodynia can lead to the triggering of a pain response from

stimuli which do not normally provoke pain ***(Merskey, 1994).*** Temperature or physical stimuli can provoke allodynia, which may feel like a burning sensation, and it often occurs after injury to a site ***(Hooshmand 1993).***

D. Hyperalgesia:

The increased response to a stimulus that is normally painful ***(Serpell, 2005).***

E. Hyperpathia:

Prolonged post-stimulus sensation ***(Serpell M, 2005).***

F. Dysaesthesia:

Evoked or spontaneous altered sensation, discomfort rather than pain ***(Serpell, 2005).***

G. Hyperasthesia:

Increased sensitivity to stimulation ***(Serpell, 2005).***

III. Classification of pain:

A. classification According to specific characteristics:

(1) Region of the body involved (e.g. abdomen, lower limbs),
(2) System whose dysfunction may be causing the pain (e.g., nervous, gastrointestinal),
(3) Duration and pattern of occurrence,
(4) Intensity and time since onset,
(5) Etiology.

(Merskey et al., 1994).