Comparative study between Bilateral U/S guided Transversus Abdominis Plane Block versus local wound infiltration for post-operative pain management in lower abdominal surgeries

Thesis

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ABSTRACT

Background: Poorly controlled acute pain after abdominal surgery is related to somatic pain signals derived from the abdominal wall and is associated with a variety of unwanted post-operative consequences, including patient suffering, distress, respiratory complications, delirium, myocardial ischemia, prolonged hospital stay, an increased likelihood of chronic pain, increased consumption of analgesics, delayed bowel function and increase the requirement for rescue analgesics. Appropriate pain treatment protocols to reduce postoperative morbidity, improve the results of the surgery and decrease hospital costs.

Objective: to assess the postoperative analgesic efficacy of transversus abdominis plane (TAP) block compared local wound infiltration after lower abdominal surgery regarding the pain relief, effect on hemodynamics, requirement of first supplemental doses of analgesia and total number of doses received.

Patients and Methods: All patients were informed with the procedure US guided TAP block and were trained to use the visual analogue scale (VAS). The study was conducted on 100 randomly chosen patients aged 25 to 55 years, American Society of Anesthesiologists (ASA) class I or II scheduled for lower abdominal surgery in Ain Shams University Hospitals after approval of the medical ethical committee. They were allocated in two groups of 50 patients each:

Results: The results of the study revealed that there is Patients receiving TAP block had significantly lower pain scores for 12 h after operation and decrease total need of analgesic in first 24 h post operative compared with patients who received wound infiltration.

Conclusion: Bilateral TAP block was effective in reducing postoperative pain scores at rest and movement for 8 -12hours and lower total 24-h postoperative opioid and analgesic consumption after lower abdominal surgeries under general anesthesia, compared to local wound infiltration..

Keywords: TAP : transverse abdominis plane; VAS : visual analogue score.

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List of Abbreviations

Abb.		Full Term
%	:	Percent
γ	:	Gamma
δ	:	Delta
κ	:	Kappa
PGE2	:	prostaglandins E2
°	:	Degree
µ	:	Mue/Micron
µg	:	microgram
5-HT	:	Serotonin
ABP	:	Arterial Blood Pressure
ACTH	:	Adreno cortico-trophic hormone
ASA	:	American Society of Anesthesiologists
AVP	:	arginine vasopressin.
BA	:	Bronchial Asthma
bpm	:	Beats per minute
Ca^{++}	:	Calcium
CGRP	:	Calcitonin Gene-Related Peptide
cm	:	Centimeter
CM	:	Costal margin
CNS	:	Central Nervous System
COO	:	Ester linkage
COX2	:	Cyclooxygenase2
CrCl	:	Creatinine clearance
CRH	:	Corticotrophin-releasing hormone
DBP	:	Diastolic Blood Pressure
DM	:	Diabetes mellitus
DRG	:	Dorsal Root Ganglion
E	:	Enkephalinergic interneurons
ECG	:	Electrocardiogram
ed.	:	Edition
EOM	:	external oblique muscle
ESR	:	Erythrocyte sedimentation rate
et al.	:	And colleagues
FDA	:	Food and Drug Administration

List of Abbreviations

Abb.		Full Term
FSH	**:**	follicle-stimulating hormone
G	**:**	Gauge
g	**:**	Gram
GABA	**:**	Gamma Amino Butyric Acid
hr	**:**	Hour
HR	**:**	Heart Rate
hrs	**:**	hours
HS	**:**	Highly significant
HTN	**:**	Hypertension
I.M	**:**	Intramuscular
I.V	**:**	Intravenous
IASP	**:**	The International Association for the Study of Pain
IC	**:**	iliac crest
IOM	**:**	Internalobliq muscle
J.	**:**	Journal
Kg	**:**	Kilogram
LAs	**:**	Local Anesthetics
LH	**:**	Luteinizing hormone
mA	**:**	Milliamperes
mg	**:**	milligram
min	**:**	Minute
ml	**:**	Milliliter
mmHg	**:**	Millimeters of Mercury
-NHCO	**:**	Amide linkage
NHS	**:**	The National Health Service
NMDA	**:**	N-Methyl-D-Aspartate
NMDA	**:**	N-Methyl-D-Aspartate
NRS	**:**	Numeric rating scale
NS	**:**	Non-significant
NSAIDs	**:**	Non steroidal anti-inflammatory drugs
P	**:**	Probability value
P	**:**	Peritoneum
PABA	**:**	Para-AminoBenzoic Acid
pH	**:**	Measure acidity and basicity of solution

List of Abbreviations

Abb.		Full Term
pKa	:	Acid dissociation constant
PONV	:	Postoperative nausea and vomiting
pp	:	Pages
S	:	Skin
SC	:	subcutaneous tissue
SD	:	Standard Deviation
Sig.	:	Significance
SpO_2	:	Peripheral Oxygen Saturation
SSR	:	Surgical Stress Response
TAM	:	Transversus abdominis muscle
TAP block	:	Transversus abdominis plane block
TENS	:	Transcutaneous Electrical Nerve Stimulation
TSH	:	Thyroid-stimulating hormone
VAS	:	Visual Analogue Scale
VRS	:	The four-point verbal rating scale
Vs.	:	Versus
α	:	Alpha
β	:	Beta
T_{1-12}	:	Thoracic spinal roots
IL-6	:	Interleukin-1
L_{1-5}	:	Lumbar spinal roots
IL-1β	:	Interleukin-1
1ry	:	primary
PC	:	Peritoneal cavity
USG	:	Ultra Sound Guidance

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INTRODUCTION

Since the concept of day case surgeries are getting more popular, surgeons and anesthesiologists are trying their best to provide adequate post-operative analgesia. The proper management of post-operative pain ensures early ambulation of patients and obviates many post-operative Complications**. (Schug et al., 2011).**

Regional anesthesia which is defined as percutaneous introduction of local anesthetics adjacent to a central or peripheral nerve to reduce or eliminate the sensation of pain from a region of the body. It was first performed by **August Bier** before the turn of the previous century. Regional anesthesia has significant benefits and comes close to the goal of complete analgesia ***(Bosenberg et al., 2011).***

The transverse abdominis plane (TAP) block is a peripheral nerve block designed to anesthetize the nerves supplying the anterior abdominal wall (T6 to L1). It was first described in 2001 by **Rafi** as a traditional blind landmark technique using the lumbar triangle of Petit ***(Nils Bjerregaard, 2012).***

Wound infiltration with local anesthetic agent is also a commonly used method for reducing post-operative pain. A single injection of local anesthesia into skin and subcutaneous tissue

layer at surgical incision sites could lower the pain scores postoperatively **(Gupta A. et al., 2005)**.

Aim of the work

The primary aim of this study is to compare the effectiveness between using bilateral ultrasound guided transversus abdominis muscle block versus local wound infilteration in management of post operarive pain in lower abdominal surgeries.

Chapter (1):

Pain

Definition:-

Pain is a subjective experience. The International Association for the Study of Pain (IASP) defines pain as an "unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage. This definition demonstrates that pain, as well as having physiological basis, has also psychological or subjective component ***(LeResche et al .,2005).***

It can be adjunct and simultaneous to nociception, the system which carries information to the spinal cord and brain about damage or near-damage in tissue. Nociception conveys somatic information without conscious awareness, while pain is a perception of sensorial information. As a part of the body's defense system, pain triggers mental and physical behaviors that seek to end the painful experience ***(Wahezi et al ., 2013) .***

It is also a feedback system that promotes learning, making repetition of the painful situation less likely. The nociceptive system may transmit signals that trigger the sensation of pain, it is a critical component of the body's ability to react to damaging stimuli and it is part of a rapid-warning relay instructing diverse