ADDIS ABABA UNIVERSITY

SCHOOL OF MEDICINE

DEPARTEMENT OF ANESTHESIA

EFFECT OF PERINUEAL DEXAMETHASONE AS ADDITIVE TO BUPIVACAINE ON TRANSVERESUS ABDOMINAL PLANE BLOCK FOR POSTOPERATIVE ANALGESIA IN ELECTIVE CESEREAN SECTION UNDER SPINAL ANETHESIA IN BLACK LION SPECILIAZED HOSPITAL, ADDIS ABABA ETHIOPIA.

Investigators: Abdisa Aga (B.Sc.)

Advisors: Meron Abrar (BSc. MSc. lecturer of anesthesia)

Zewter Asheber (BSc. MSc. lecturer of anesthesia)

.

May, 2019

Addis Ababa, Ethiopia

Addis Ababa University

College of Health Sciences

Department of Anesthesia

A thesis submitted to be Addis Ababa University department of Anesthesia as partial fulfillment of requirements for the masters of sciences degree in Anesthesia.

NAME OF INVESTIGATOR	ABDISA AGA
TITTLE OF THE THESIS	Effect of Perineural dexamethasone as additive t bupivacaine on transverse abdominal plane bloc for post-operative analgesia in elective cesarea section under spinal anesthesia
PROTOCOL NUMBER	
DURATION OF PROJECT	SEPTEMBER, 2018-JUNE, 20019
STUDY AREA	Black lion specialized hospital
ADDERESS OF INVESTIGATOR	e-mail: abdisaaga86@gmail.com Phone no: 0923961658
THESIS SUBMISSION DATE	May

DECLARATION

I, the undersigned, declare that this thesis is my original work in partial fulfillment of the requirements for the Master of Science degree in Anesthesia. I understand that plagiarism will not be tolerated and all directly quoted material has been appropriately referenced

Name: _____

Signature: _____

Submission to MSc Tutor, Dept. of Anesthesia, Addis Ababa University.

Date of Submission: _____

This thesis work has been submitted for examination with my/our approval as Advisors and Tutors on the Master of Science degree in Anesthesia

Name Signature

1. _____ _____

2. _____ _____

3._____ _____

ACKNOWLEDGMENT

First of all I would like to express my greet thanks to Department of Anesthesia School of Medicine College of Health Science Addis Ababa University for giving this opportunity to perform this research thesis.

I would like to express my heart-full gratitude and thanks to my advisors Ms. Meron Abrar, Mr. Zewter Asheber for their invaluable support and comments. And my data collectors for your dedication and precious work in collecting data.

I would like to express my heart-full gratitude and thanks to Mr. Fetene Seyoum for his invaluable comments and endless support.

Additionally I would like to extend my great gratefulness towards those authors and researchers of articles and on-line information for the valuable works I have read and cited in my research thesis

.

ABSTRACT

Background: The transverses abdominal plane (TAP) block is straightforward regional technique used for postoperative analgesia in patients undergoing lower abdominal surgeries. Dexamethasone is steroid which is mostly used drug as adjuvant or additive in most of regional block in order to intensify quality and prolong the block.

Objective: To assess effect of Perineural dexamethasone as additive to bupivacaine on transverse abdominal plane block for post-operative analgesia in elective cesarean section under spinal anesthesia at black lion specialized hospital.

Methodology: An institutional based prospective cohort study was conducted on 58 patients. Study participants were selected by systematic random sampling technique. Data collection methods include preoperative chart review, intraoperative observation and postoperative patient interview starting at 2, 4, 6, 12 and 24 postoperatively. Demographic data were analyzed using student t test and Chi square and Fisher's exact test. Mann –Whitney U test was used to compare the pain severity, first analgesia request time as well as analgesic consumption between the groups in the postoperative time for 24 hours. Chi-square test was used to analyze the homogenous categorical variables and a p-value less than 0.05 was considered as statistically significant.

Result: This study found that TAP D has prolonged time to first analgesia request with a median duration of 8.5 hours compared to 5.5 hours in TAP A (alone) ($p<0.001$). The total analgesic consumption was lower in TAP D group with a median total dose of 50mg compared with 100 mg in TAP A group with statistically significant difference within 24 hours ($p<0.003$). Also, reduced the pain score in TAP D group, being statically significant at 6th, 12th and 12th hr.

Conclusion and Recommendation: We found Perineural dexamethasone as additive on TAPB decrease postoperative pain severity, total analgesic consumption and prolong the duration of analgesia. Based on our finding we recommend the use of Perineural dexamethasone as additive on TAPB as effective postoperative analgesia in our setup.

Key words: Perineural dexamethasone with transverse abdominal block, transverse abdominal plane block.

CONTENTS

List of table

List of figure

List of Abbreviations and Acronyms

AAU Addis Ababa University

ASA American society of Anesthesiology

BMI Body Mass Index

BSC Bachelor of Science

C/S Caesarian Section

LA Local Anesthesia

MSc Master of Science

NRS Numeric Rating Scale

PCA patient controlled analgesia

PI principal investigator

RCT Randomized Clinical Trial

SA Spinal Anesthesia

SD Standard Deviations

SPSS Statistical Package for Social Science

TAP D transverse abdominal plane with Perineural dexamethasone

TAP A Transverse abdominal plane block alone

VAS Visual Analogue scale

CHAPTER ONE: INTRODUCTION

1.1 Background

Caesarean section is one of life saving procedures surgical intervention attributed to the decrease both fetal and maternal mortality and morbidity rates. (1)

Even though the World Health Organization (WHO) has recommended a Caesarean section rate of between 10 and 15% (average 12.5%) as an acceptable level, the rate of cesarean section was dramatically increasing across worldwide with unevenly distribution. And results 18.6%. Latin America and the Caribbean region has the highest CS rates 40.5%, followed by Northern America 32.3%, Oceania 31.1%, Europe 25%, Asia 19.2% and Africa 7.3%, which is a weighted average between 3.5% in sub-Saharan Africa and 27.8% in Northern Africa.(2)

According to study done in 2017 in Ethiopia the overall prevalence of Caesarean section in Hospitals in Addis Ababa was 38.3%. Private health facilities performed more Caesarean section than public health facilities, 46.9% and 34.0% respectfully. (3)

Therefore, as caesarean section is the most commonly performed procedure postoperative pain management is mandatory and the analgesic regimen needs to meet the goals of providing safe, effective analgesia, with minimal side effects for the mother and her child.

Even though there are different postoperative pain management modalities, opioids and non-steroidal anti-inflammatory drugs are regular prescribed drugs for postoperative pain relief in our setup. However, systemically administered opioids are causing adverse effects of sedation, nausea, vomiting, urinary retention, respiratory depression, delayed recovery, and prolonged postoperative ileus (4)

On the other hand, TAP block analgesic is another best option that can lower severity of pain, nausea and vomiting and paralytic ileus at post-operative period. It is also having in reduction of postoperative morbidity, duration of hospitalization and hospital costs (5).

The transverses abdominal plane (TAP) block is straightforward regional technique used for postoperative analgesia in patients undergoing abdominal surgeries whereby local anesthetic is deposited in the plane between the internal oblique (IO) and the transverses abdominal (TA) muscle (6).

TAP block was simple to perform, and effective peripheral abdominal field block that blocks the lower intercostal (T7–T11), ilioinguinal, and iliohypogastric nerves. It was a modified technique in which the local anesthetic was injected in the neurovascular plane between the transverses abdominal muscle and internal oblique muscle of the anterior of the abdominal wall via the lumbar triangle of Petit. It was bounded posteriorly by the latissimus dorsi muscle and anteriorly by the external oblique and iliac crest forming the base of the triangle (7) (8).

TAPB was performed by Blind or land mark technique other than US guided, by appreciation of double pop sounds. It was first described in 2001 by Rafi as a blind land mark technique using the lumbar triangle of Petit (9). There were studies which showed that the injection of drugs via the triangle of Petit using the "double pop" technique resulted in reliable deposition into the transverse abdominal plane (7).

Various trials have studied the role of TAP block for post cesarean analgesia. Results showed adequate analgesia, decreased consumption of opioids, and decreased nausea and sedation in postoperative period, however, the improved analgesia is short lived. (10)

Dexamethasone is a high-potency, long-acting glucocorticoid with little mineralocorticoid effect that has been used for prophylaxis of postoperative nausea. .Its anti-inflammatory and blocking effects on neural discharge, and nociception c-fibers transmission could be used as a local anesthetic adjuvant. (11).

1.2 Statement of the Problem

Pain is an unpleasant sensory or emotional experience associated with actual or potential tissue damage. Although pain is a predictable part of the postoperative experience, inadequate management of pain is common and can have profound implications (12) The provision of effective postoperative analgesia after cesarean section is key importance to facilitate early ambulation, infant care, (including breast feeding, maternal-infant bonding) and prevention of postoperative morbidity. (13)

Cesarean section commonly induces postoperative pain moderate-to-severe pain for up to 48h.(9) And the estimated immediate postoperative pain incidence rates after cesarean sections under SA accounts 77.4% with the average level of pain intensity at the time of worst pain was 6hr post cesarean section. (14)

Untreated postoperative pain may result several systemic effects like deep vein thrombosis, pulmonary embolism, coronary ischemia, myocardial infarction, pneumonia, poor wound healing, insomnia, and demoralization, this all effects economic and medical implications, such as extended lengths of stay, readmissions, and patient dissatisfaction with medical care (15, 16)

In adequately treated acute postoperative pain after cesarean section is associated with an increased incidence of chronic pain which is 10-15% (13) and post-traumatic stress syndrome. Not only these, women with severe pain on the day after cesarean delivery have a 2.5 -to 3-fold increased risk of postpartum depression and persistent pain 8 weeks later compared with those mild pain.(17)

Therefore adequate postoperative pain management after cesarean section mandatory in order to alleviate such type of complications.

The administration of opioids, local blocks and other analgesic medication is instituted to decrease the duration and intensity of post- operative pain as part of a multimodal analgesia regimen. (18, 19)

Eventhoug invariability and unaffordability the equipment is challenges to use in our setup, Epidural patient-controlled analgesia (PCA) is also anther golden standard analgesic technique that provide postoperative pain in cesarean section, thereby improving the mother's ability to mobilize and interact with her newborn. Epidural opioid also provides good pain control during the first

postoperative day but is associated with nausea, vomiting, sedation, pruritus, urinary retention, and respiratory depression (20)

Various trials have studied the role of TAP block for post cesarean analgesia. Results showed adequate analgesia, decreased consumption of opioids, and decreased nausea and sedation in postoperative period, however, the improved analgesia is short lived. Due to its duration is limited to effect of administered local anesthetics. (21)

Postoperative continuous transverse abdominal block after single shot after lower abdominal procedure is also another technique that provide effective analgesia for prolonged period with decreased postoperative opioid consumption. Although it's used is limited in our seta up due lack of equipment. (22)

Another way to prolong the effect of LA is the addition of adjuvant substances as Alpha- 2 adrenoreceptor agonists (clonidine, Dexmedetomidine), adrenaline, tramadol, midazolam, ketamine, opioids, adenosine, non-steroidal anti-inflammatory and steroid to the local anesthetic drugs in TAPB and their efficiency have been studied.(23, 24, 25)

The analgesic effects of spinal and systemic corticosteroids in combination with local anesthetics have been approved in human studies. (26)Dexamethasone, a glucocorticoid, is now emerging as a new adjunct to LAs for prolonging the duration of action and has been studied in different blocks such as axillary, (27) interscalene, (28) and supraclavicular blocks. (29)

A number of systematic reviews and meta-analyses have confirmed the efficacy of dexamethasone for prolonging the duration of peripheral nerve blocks (30, 31 and 32). More specifically, dexamethasone provides better analgesic efficacy and decreased analgesic consumption post-operatively compared with LA alone. However, recent well-designed randomized controlled trials have failed to show statistically significant prolongation of LA effects when dexamethasone was used as an adjuvant to the TAP block (33, 34).

Their also another study that shows Perineural dexamethasone has no additive/synergistic effect with subcostal TAP block on analgesic efficacy for the patients undergoing laparoscopic cholecystectomy, when compared with those receive TAP block alone (35).

Due to this reason and there are limited studies done on the use of dexamethasone as an adjuvant with TAP block with bupivacaine for CS, that why we need to do more.

1.3 **Significance of the study**

Transverses abdominals plane block is a relatively new technique used in a multimodal approach to provide postoperative analgesia following lower abdominal surgery including cesarean section. It is a technically simple block to perform, with a high margin of safety. TAP block with adjuvant like dexamethasone decrease post-operative analgesic consumption, increase the time to first request for analgesia, the duration, intensity of the block and provide prolonged and effective pain alleviation

More specifically, dexamethasone provides better analgesic efficacy and decreased analgesic consumption post- operatively compared with LA alone. It is very effective, easily available and it costs minimal.

However, recent well-designed randomized controlled trials (RCTs) have failed to show statistically significant prolongation of LA effects when dexamethasone was used as an adjuvant to the TAP block (33, 34). There is controversies regarding use of dexamethasone as adjuvant with TAPB in prolongation of the block, so these is the reason why I need to do further on this topic.

While decrease post-operative opioid consumption and related side effect like sedation, nausea and vomiting. Therefore conducting Research on study the effect of dexamethasone as additive to bupivacaine on TAP block for postoperative analgesia in cesarean section, will help to improve pain management with decreased side effects.

Therefore the result of this study will have a contribution for improvement of postoperative pain management and patient satisfaction. Moreover, this study will provides evidence based data that are necessary for further development of new protocol, providing in-service education, training for hospital staff and provides stepping stone for further research activities in related topic.

CHAPTER TWO: LITERATURE REVIEW

Efficacy of TAP block

Study done in India on 60 patient undergoing cesarean section under spinal anesthesia, were randomized to undergo TAP block with bupivacaine (n = 30) versus placebo (n = 30). The result of the shows that, the mean tramadol use was significantly less 8, 12, and 24 h after surgery in TAP Group in relation to non-TAP group. The cumulative tramadol usage during first 24 h after Surgery was significantly reduced in study TAP group in comparison to non-TAP group (75 ± 22 vs. 168 ± 45 mg in TAP group and non-TAP group, respectively, $P< 0.0001$). Overall tramadol Consumption was reduced approximately by 50% in TAP group compared to non-TAP group in First 48 h (127 ± 24 vs. 253 ± 52 mg in TAP group and non-TAP group, respectively, $P< 0.0001$) (36).

The study done in Debretabore on 40 patient underwent CS under SA, showed that time to 1st analgesic request with (mean ±SD) was (286.0 ±166.31) vs. (76.25 ±22.05), in TAP with bupivacaine and non-TAP groups respectively, ($p< 0.001$) (37)

Effect of Perineural dexamethasone

Dexamethasone is a high-potency, long-acting glucocorticoid with little mineralocorticoid effect that has been used for prophylaxis of postoperative nausea. .Its anti-inflammatory and blocking effects on neural discharge, and nociception c-fibers transmission could be used as a local anesthetic adjuvant. (11).

How dexamethasone would prolong regional anesthesia is a subject of much discussion. The proposed mechanisms of action is steroids induce a degree of vasoconstriction, so one theory is that the drug acts by reducing local anesthetic absorption. A more attractive theory holds that dexamethasone increases the activity of inhibitory potassium channels on nociceptive C-fibers (via glucocorticoid receptors), thus decreasing their activity. (44)

Dexamethasone used in a regional block to prolong analgesia for peripheral and neuraxial blocks. The routes of administration and dosage are currently controversial to reduce the potential for complications with efficacy. Dexamethasone may be used preoperatively in regional techniques in all non-diabetic patients (38).

Systematic review and meta-analyses done in Canada in 2014 by S Choi et al on effect of Perineural dexamethasone as adjuvant on brachial plexus block for post-operative pain management, compared brachial plexus block performed with LA alone with that of Perineural dexamethasone. The LA subgroup (long vs. intermediate). The primary outcome was duration of sensory block and secondary outcomes were motor block duration, opioid consumption and blocks complication. He found that Perineural dexamethasone with LA prolongs brachial plexus block both sensory and motor with no adverse events (35).

A randomized clinical trial study conducted by Deshpande, *et al* in India in 2017 on 60 patients undergo elective open abdominal hysterectomy under general anesthesia, comparing bilateral TAP block between two groups. Group A, those receive 20 ml of 0.5% ropivacaine + 4 mg dexamethasone and Group B, those receive 20 ml of 0.5%ropivacaine + 1 ml of 0.9% saline (control Group). He concluded that postoperative VAS pain scores were significantly lower at 4, 6, and 12 h in Group A as compared to Group B ($P < 0.05$). Significantly longer TFA (13.2 ± 7.6 vs. 7.1 ± 4.6 h, $P < 0.001$) with lesser tramadol requirement in first 24 h (50.2 ± 34 vs. 94 ± 35 mg, $P < 0.001$) were observed in Group A as compared to Group B. Incidence of nausea or vomiting was statistically insignificant between the Groups ($P > 0.05$). (39)

Another prospective RCT conducted by Robert Wegner, et al in USA in 2017 on 80 patient undergoing inguinal hernia repair or spermatocelectomy under general anesthesia showed that, among 41 patient receive TAPB with 20 ml of 0.2% ropovacaine with 2 ml 8mg dexamethasone and other 41 receive TAP with 20 ml of 0.2% ropovacaine with 2ml saline immediately following the surgery. The result showed that, there was a decrease in the VAS scores from the baseline and at 12 hours post block in both the groups. According to this study their no significant differences in change from baseline at 24 hrs. and 48hrs between the 2 groups (P value = 0.74 and 0.44, respectively). (34)

A randomized clinical trial conducted in Turkey by Akcan Akkaya et al., in 2014 on 42 patients undergoing CS under SA in ASA I-II risk group were included in the study and divided into two groups bilateral 30 ml 0.25% levobupivacaine and 2 ml 0.9% NS for the levobupivacaine group and bilateral 30 ml 0.25% levobupivacaine and 2 ml dexamethasone (8 mg) for the dexamethasone group were administered in a TAP block performed with US guided immediately at the end of

surgery. Post-operative mean time for the TFA was prolonged significantly in the dexamethasone group compared to the levobupivacaine group (13 ± 7.8) vs. (6.1 ± 4.8) respectively with p =0.001. Total tramadol consumption was decrease in levobupivacaine group with mean and standard deviation were 92.9±36 in Group levobupivacaine and 50.0±35mg in Group Dexamethasone which is significant difference with: p = 0.001. (43).

A study done in Indian in 2016, on ASA I and II patients undergoing CS under SA. Patients were randomly allocated to two groups comprising 35 patients each. Patients in Group I received ultrasound-guided bilateral TAP block at the end of surgery using 40 ml ropivacaine 0.2% and 2 ml saline, and those in Group II received the block using 40 ml ropivacaine 0.2% and 2 ml (8 mg) dexamethasone. The result of the study shows that the TFA was significantly longer in Group II (5.92 ± 1.02 h) versus Group I (3.11 ± 0.82 h). This is statistically significant with P = 0.00. The total postoperative tramadol consumption was also lesser in Group II. It was 140.00 ± 50.26 mg in Group I versus 100.00 ± 0.00 mg in Group II and it was statistically significant with P = 0.04662. And also the incidence of nausea and vomiting in Group II was also lower (82.86% vs. 97.14%, P = 0.02318). (41).

A prospective RCT done by Raghukumar Mamatha, et al and his colleagues in 2017 on 60 patients posted for elective cesarean delivery under spinal anesthesia were selected for the study. Patients received TAP block at the end of surgery with, 20ml of 0.125% Bupivacaine with Dexamethasone (4mg), Clonidine (25µg), Saline (2ml) on each side, in groups D, C and B respectively. Post-operative VAS scores were comparable in all the three groups in the first 12hr, it was higher in group B in the next 36hrs. Time to first analgesic request was prolonged by 2hrs in all three groups. Tramadol requirement was significantly lower in the group C and group D after 12hrs and they conclude that both dexamethasone and clonidine have comparable effect on duration of TAP block. (45).

A prospective, double-blinded controlled trial done in Egypt on 90 patient underwent radical cystectomy under general anesthesia, were enrolled in the study and were divided into three groups: group I was given TAP block with 20 ml 0.25% bupivacaine + 2 ml dexamethasone (8 mg)/side (n = 30); group II was given TAP block with 20 ml of 0.25% bupivacaine + 2 ml NS (n = 30); and group III was given general anesthesia without TAP block (n = 30). And the block was given after

end of surgery. The result showed that adding dexamethasone to bupivacaine compared with bupivacaine alone resulted in a reduction in the postoperative VAS for pain score, a longer TFA (220.5 ± 25.02 vs. 140.54 ± 15.12 min, P < 0.001), and lesser 24-h morphine consumption (5.11 ± 3.01 vs. 17.20 ± 7.75 mg, P < 0.001). (47).

Amany S. Ammar and Khaled M. Mahmoud; have done study in Egypt on patient undergoing abdominal hysterectomy under general anesthesia, to compare effect of 20ML bupivacaine hydrochloride 0.25% + 2ML Saline 0.9%(control Group, n=30) or 20ML of bupivacaine hydrochloride 0.25% +2ML Dexamethasone 8Mg. (Dexamethasone group n=30).and found to be the pain VAS score was significantly lower at postoperative 2h (4.9 vs. 28.1, p=0.01), 4h (12.2 vs. 31.1, p=0.01). Furthermore, time to first analgesia was significantly longer in the Dexamethasone group (459.8 vs. 325.4 min, p=0.002), lesser morphine requirement in the post-operative 48h (4.9 vs. 21.2mg, p=0.003) and lower the incidence of nausea and vomiting (6 vs14, p=0.03). No complication attributed to the block was recorded. (40).

Another Egyptian, prospective RCT study which is done by Fouad, et al., in 2016 on 50 adult male patients aged 20 to 60 years, with ASA class I or II, those scheduled for elective inguinal herniorraphy under general anesthesia . Patients were randomly allocated to receive TAP block using 20 mL of bupivacaine hydrochloride 0.5% + 2 mL saline 0.9% (control group, n=25) or 20 mL of bupivacaine hydrochloride 0.5% + 2 mL dexamethasone “8mg” (dexamethasone group, n=25). TFA was significantly longer in the dexamethasone group (438.2 ± 24.95 min vs. 272.04 ± 37.51 min, P=0.002), with lesser nalbuphine requirements in the postoperative24 h (15.20 ± 4.16 vs. 24 ± 4.16 mg nalbuphine, P <0.001) and lower incidence of nausea and vomiting (2 vs. 8, P=0.034). No complications attributed to the block were recorded (42).

Comparable Effect between Bupivacaine, Ropivacaine and Levobupivacaine

Study done in India in 2017 by Laxman Bhagwanrao Poulkar et al compare analgesics efficacy between ropivacaine and bupivacaine caudal anaesthesia in paediatric patients group those received 0.25% Ropivacaine -1 ml/kg and 0.25% Bupivacaine -1 ml/kg intra operatively after induction . Both group of patient premeditated with midazolam 0.03 mg/kg, inj, glycopyrrolate 0.04 mg/kg and sedated with inj. ketamine 1 mg/kg i.v. and he found that there were no significant differences between the two groups in base line parameters. Duration of analgesia for Ropivacaine was 5.92

±1.24 hrs. And Bupivacaine was 6.17 ± 1.1 hrs. Which was no significant difference in duration of analgesia in two groups. (46).

On the other hand randomized control trial study in India by Ankesh et al and his collogues in 2018, compare 0.25% levobupivacaine and 0.25% ropivacaine in transversus abdominis plane block for postoperative analgesia following lower segment caesarean section under SA and found that post-operative VAS score was comparable in both groups (P>0.05) and mean duration of analgesia was 1454.266 (24 hrs.) min with SD ± 542.798 (9 hrs.) in levo bupivacaine and 1303.833 (22 hrs.) min with a SD ± 552.447 (9 hrs. 20 minutes) in ropivacaine. Which was insignificant with P value < 0.05. (48)

Another study done in Turkey 2018, by A Yildirim Ar et al and his collogues compare of efficacy of 0.25% bupivacaine and 0.25% levobupivacaine on TAP block in patient undergoing cholecystectomy for postoperative pain control. And they found VAS scale levels showed no difference except first and fifth minute postoperatively where VAS was higher in levobupivacine (p< 0.05). Analgesic requirement was similar in both group. Time to first analgesic requirement was in levobupivacaine (4.35±6.92min vs. 34.91±86.26min, p=0.013) which was insignificant and conclude that bupivacaine and levobupivacaine showed similar efficacy at TAP block in patients undergoing laparoscopic cholecystectomy. (49)

Another RCT done in Greece by .Dr Byron Chalidis, et al in 2013, and compare efficacy 0.5% ropivacaine vs. 0.5% bupivacaine for 3-in-1 block on patient underwent total knee arthroplasty. Patient was randomly assigned into two (n=20) in both group and receive 0.5 ml/kg of both group respectively. In addition, a sciatic nerve block with 20 ml of pilocaine 1% was used and he conclude that ropivacaine and bupivacaine showed similar anesthetic and analgesic effect, but there were significant faster onset with ropivacaine (50).

Research hypothesis

Ho1: There is no difference in the time to first analgesic request between exposed and non-exposed groups.

Ha1: - There is difference in the time to first analgesic request between exposed and non-exposed group

HO2: - There is no difference in the severity of postoperative pain between exposed and non – exposed groups.

Ha2: - There is difference in the severity of postoperative pain between exposed and non –exposed groups.

HO3: -There is no difference for the total analgesic consumption in the first 24 postoperative hours between exposed and non-exposed groups.

Ha3: -There is difference for the total analgesic consumption in the first 24 postoperative hours between exposed and non-exposed groups.

CHAPTER THREE: OBJECTIVES

3.1 **General objective**

To assess effect of Perineural dexamethasone as additive to bupivacaine on transverse abdominal plane block for post-operative analgesia in elective cesarean section under spinal anesthesia at black lion specialized hospital from January to May 2018/2019.

3.2 **Specific objectives**

- To compare first analgesia request time in minute between TAP D and TAP A group
- To compare postoperative pain score by NRS between TAP D and TAP A group
- To compare the total postoperative analgesic consumption in milligram within the first 24 hours between TAP D. and TAP A. group.
- To compare postoperative e incidence of nausea and vomiting between TAP D and TAP A group

CHAPTER FOUR: METHODOLOGY AND MATERIALS

4.1 **Study area and period**

The study was conducted black lion specialized hospital which is the largest hospital, multi-specialist tertiary care teaching hospital located in Addis Ababa, Ethiopia, opened since 1972 and in 1998 transferred to school by FMOH since then it became a university teaching hospital. It offers diagnosis and treatment for approximately 370,000-400,000 in a year.

TASH is now the main teaching hospital for clinical and preclinical trainings of most disciplines. It is also an institution where specialized clinical services that are not available in other public or private institutions are rendered to the whole nation. It has about 800 beds, it had about 17 operation theatre and approximately 7000-9000 patents undergo surgery in a year including emergency surgery. More than 900 health professionals in the different specialties dedicated to providing health care services, and the various departments' residents under specialty training in the school of medicine also provide patient care in the hospital. This study was conduct from October to May 2018/2019.

4.2 Study Design and period: An institutional-based prospective cohort study was employed from

4.3 Population

4.3.1 Source Population: All mother who scheduled for elective cesarean section at black lion specialized hospital.

4.3.2 Study Population: All mother who underwent elective cesarean section under spinal anesthesia and received TAPB with or without dexamethasone in the study period.

4.4 Study Variables

4.4.1 Dependent Variables

- Time to First Analgesic Request in minute
- Post-operative Pain severity (NRS score 0-10),and
- Total analgesic consumption in milligram (Diclofenac or/and Tramadol)
- Incidence of postoperative nausea and vomiting

4.4.2 Independent Variables

- Socio-demographic variables**:** ASA status, Age, BMI**,** Height**,** Weight
- Exposure status (to TAP alone and TAP with dexamethasone)
- Duration of surgery
- Dose of bupivacaine give for spinal anesthesia
- Gravidity status
- ASA status
- Type of incision
- History of previous surgery

4.5 Eligibility Criteria

4.5.1 Inclusion Criteria

- Patients underwent elective C/S under spinal anesthesia and received TAPB with or without dexamethasone
- ASA I and ASA II patient

4.5.2 Exclusion Criteria

- Patient refusal to give informed consent
- Patient took any type of ant pain night before surgery/preemptive analgesia
- Patients on recent use of glucocorticoids
- Dexamethasone given other than with TAP block
- known allergy to LAs/opioids/non-steroidal anti-inflammatory drugs
- patients with diabetes mellitus, pregnancy-induced hypertension, and
- BMI>30Kg/m^2

4.5 Sample size and sampling technique

4.5.1 Sample size determination

The primary outcome of our study were to compare time to first analgesic request, pain severity by NRS score and total analgesic consumption with in 24hr. since there is no previous study done in these area and the result adopted from literature to calculate the sample size was not enough to represent the study. We decided to do pilot study to get appropriate and representative sample number. According to principle of pilot study, the sample size for pilot is determined by taking 10% of total number sample size used in previous study which was related to the current study. So by considering these pilot study has been carried out at zewditu hospital. By taking 10% of total sample size from previous study done on 2016 in Egypt in which total number of 60 patient was enrolled.

According to principle of pilot study 10% of 60 patients becomes 6 patient. Then we decided to take a couple 3 patient's time to first analgesia request (hr.) by taking any arbitrary hours from both groups.

The first analgesia request hour for TAP with Perineural dexamethasone group were 4hr, 9hr and 8.45h versus 4.5hr, 5hr and 7hr for that of TAP alone group. Based on these values we try to calculate the sample mean and standard deviation manually as followed. By using formula of sample mean, the calculated time to first analgesia request mean was 7.15hr and 5.5hr in TAP D and TAP A group respectively.

$$S^2 = \frac{\text{sum of (value} - \text{sample mean)}^2}{\text{sample size} - 1}$$

$$= \frac{\sum (\text{value} - \text{sample mean})^2}{n - 1}$$

$$= \frac{\sum_{i=1}^{n} (X - \overline{X})^2}{n - 1}$$

Then $SD = \sqrt{S2}$

Where

S2 = sample variance

SD = standard deviation

Based on the above formula the calculated SD was 2.7 and 1.32 for TAP D and TAP A groups respectively.

The calculated sample size was cross checked by G-power and the sample size was the similar with manually calculated sample.

Finally, by comparison of mean with equal sample size for two independent result based on mean time to first analgesia request among the group sample size was determined as follow:

$$n_1 = \frac{(\sigma_1^{\,2} + \sigma_2^{\,2})(Z_{\alpha/2} + Z_{\beta})^2}{(\mu_1 - \mu_2)^2}$$

Where

n1=sample for bupivacaine group.

n2=sample for dexamethasone group.

μ1 = sample mean in bupivacaine group.

μ2 = sample mean in dexamethasone group.

μ1 - μ2 = the difference the investigator wishes to detect.

(σ1)2 = sample variance in bupivacaine group.

(σ2)2 = sample variance in dexamethasone group.

A conventional multiplier for alpha =0.05, which is 1.96.

Conventional multiplier for power = 0.80 which is 0.84.

Substituting for this variables yields.

$$n1=n2 = \frac{(2.7^{\,2} + 1.32^{\,2})\,(1.96+0.84)^2}{(7.15 - 5.5)^2}$$

$$= \frac{70.81}{2.72} = 26$$

Ten percent of additional sample was included by assuming loss to follow up from the study and the total sample was become 29 for each group or total of 58 patients.

The manually calculated sample size number was also cross by determining sample size using G*Power. The calculated result was similar in both methods.

4.5.2 Sampling procedure

From the five governmental hospitals which are site of clinical attachment for MSc Anesthesia program, black lion specialized hospitals was selected by simple random sampling technique.

Systematic random sampling technique was used to select study participants on daily operation schedule list. Depending upon average values of the previous surgery per 3 months on the log book, 198 patients were operated elective cesarean section under spinal anesthesia.

The sampling interval k was determined using the formula: k=N/n; where, n = total sample size, N = population per 3 months.58 participants were recruited with the probability of about 34%. the patient were sorted by listing elective cesarean section consecutively therefore, the sample interval is 3 and the first study participant (random start) was selected using lottery method after which data collector recruited 1 patient for every 3 patients undergone CS grouping based on patient who fulfill the inclusion criteria was divided into two groups based on status.

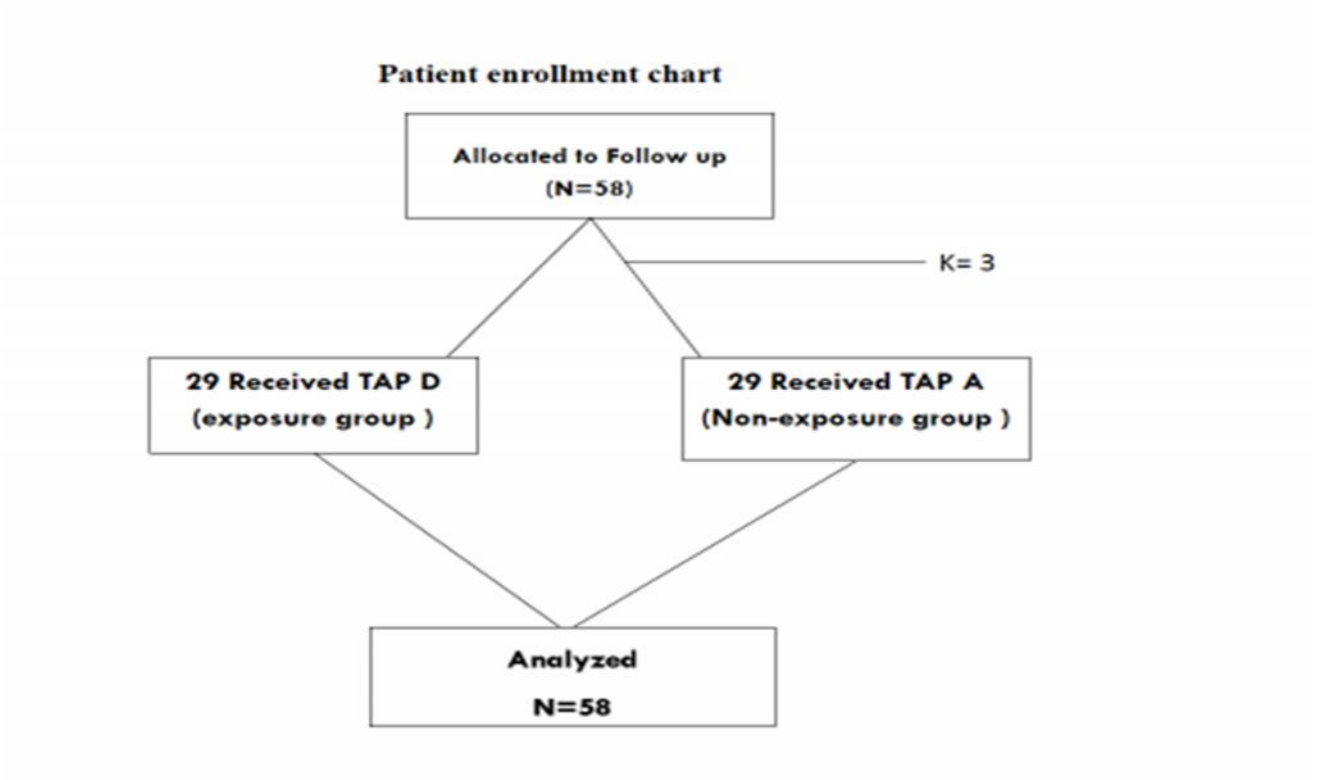


Figure I: Participant enrollment chart

4.7 Data Collection Tool and Procedure

After providing training for data collectors, data was collected using pretested questionnaires with multiple close-ended questions on respondents. Patients scheduled for elective cesarean section who fulfill inclusion criteria and volunteer to take part in the study was thoroughly assessed before surgery by history taking, and chart review following informed consent. On the morning of the surgery data collector, instruct the patient on how to self-report pain using the eleven point NRS score 0 to 10.Sociodemographic and intraoperative variables was filled by anesthetist in charge and the remaining postoperative data was collected by the other data collector who is unaware of group allocation.

On arrival of the patients to the operative theater, and after application of the routine hospital monitoring protocol, HR, noninvasive blood pressure, and SPO2 has been recorded before spinal anesthesia is given. All study patients received standard pre- and intraoperative monitoring. Spinal anesthesia was given after strict aseptic technique was done with iodine and alcohol and the area is well marked subarachnoid injection is made with 2.5ml/12.5mg of 0.5% bupivacaine between L3 and L4, after adequate CSF flow in sitting position.

During intraoperative period HR, NIBP (SBP and DBP), SPO2, RR, and intraoperative analgesic consumption was recorded after induction and at the end of surgery.

After the end of surgery, M.Sc. anesthesia professionals including M.Sc. anesthesia student provide bilateral TAP block with 20 ml of 0.25% bupivacaine.

Transverses abdominal plane block techniques: TAP block has been performed by MSc anesthesia trainee in charge with the patient. Following aseptic preparation of skin, the site of block was identified by marking costal margin and superior iliac spine and palpate the latissimus dorsi muscle and forming the lumbar triangle of Petit. Injection was made with 22G needle after passing two “pop” sound, the first pop sound heard when we pass external oblique muscle and the second sound heard internal oblique muscle. Then bilateral 20ml of 0.25% bupivacaine deposited between internal oblique and transverse abdominal muscle. Most of time the correct deposition is confirmed by observing back flow of the drug.

In the post-operative time at ward, postoperative pain was assessed in all groups using a NRS for pain assessment.

The scale consists of horizontal lines ranging from 0 (no pain) to 10 (worst imaginable pain). Asked to report their pain based on 11 point NRS score. The pain intensity was rated as mild (NRS: 0–3), moderate (NRS: 4–6), and severe (NRS: 7–10). The NRS score were recorded post-operative at 2, 4, 6, 12, and 24hr. At the times of pain evaluation, the heart rate, the mean arterial blood pressure, respiratory rate, and SPO2were be recorded.

The time to the first request was recorded from patient chart after admission to ward and total Diclofenac and tramadol consumption within 24hr was recoded and any incidence of nausea and vomiting also recoded.

4.8. Data Quality Control and Assurance

To assure the reliability and validity of the data, questionnaires were pretested on 5% of the sample size before actual data collection. Training and orientation about the objectives and relevance of the study, each items included in the study tools and the whole process of data collection were provided for data collectors and supervisors. Informed consent was obtained from the patients. During data collection, regular supervision and follow up were undertaken. A supervisor was check each questionnaire daily with further cross check by principal investigator for completeness and consistency of data. Data clean up and crosschecking of missing data was done before analysis on SPSS.

4.9. Data Processing and Analysis

Data were entered and analyzed using SPSS V 20 for analysis. The data were tested for normality using histogram and Shapiro–Wilk normality test and homogeneity of variance by Levene's test for normally distributed. Numeric data were described in terms of mean ± SD for symmetric and median (Interquartile range) for asymmetric numeric data. Comparison of numerical variables between study groups were done using unpaired student t- test and Manny Whitney test based for symmetric and asymmetric data respectively.

Frequency and percentage were used to describe categorical variable and statistical difference between groups were tested using Chi square and Fisher's exact test. A p value <0.05 with power of 80% considered statistically significant.

4.10. Ethical consideration

Ethical clearance was obtained from the department ethical clearance committee before the start of the study. Official support letter was written to Hospitals and Addis Ababa Heath Bureau and permission for data collection were sought from the responsible authorities. The purposes and the

importance of the study were explained and verbal as well as written informed consent was obtained from each participant. Confidentiality was maintained at all levels of the study by avoiding identifiers and using codes to identify patients. The participant's involvement in the study were on a voluntary basis, participants who are not willing to participate in the study and those who wish to quit their participation at any stage were informed and allowed to do so without any restrictions

4.11. Dissemination plan

The research will be presented for the entire department of anesthesia staff. It will also be presented at the annual research conference. The research will be submitted to journals for publication.

4.12. Operational definitions

Perineural – around a nerve

Additive – something that is added as one substance to another, to alter improve the general quality o to counteract undesirable effect.

Transverse abdominal plane (TAP) block- is a peripheral nerve block designed to anesthetize the nerves supplying the anterior abdominal wall (T7 – L1) (1, 2).

Triangle of petit- The area on the lateral abdominal wall bounded by the iliac crust, the posterior margin of the external oblique muscle, and the lateral margin of the latismusdorsi muscle.

Pop Sound: Sound feels during the needle pierce external and internal oblique muscle

Numeric Rating Scale: Is a valid pain intensity assessment tool that involves asking a patient to rate his or her pain from 0-10(11point scale) with the understanding that 0 equal to no pain and 10 equal to the worst possible pain (40).

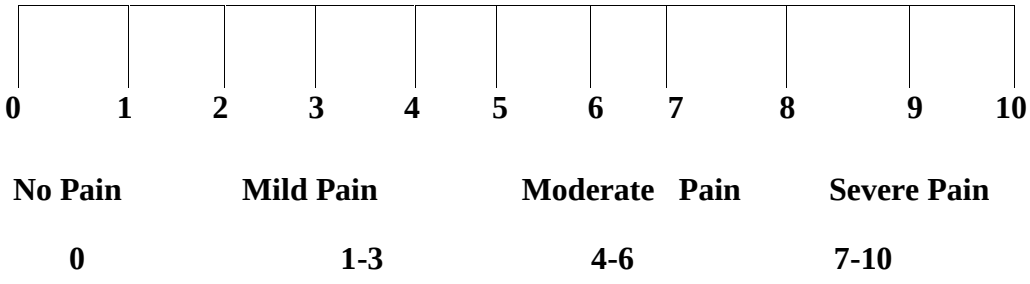


*Figure II: **Numeric Rating Scale:***

Acute postoperative pain is the pain experienced immediately after an operation, usually lasting for days or sometimes weeks

Chronic pain is normally considered to be pain that persists or keeps coming back for more than three months or for longer than the expected healing time

Chronic post-surgical pain: pain that develops after a surgical operation which lasts for at least three months

Duration of analgesia: a time in minutes was defined as the time taken from the TAPB performed till the first recording VNSR score >3

Duration of surgery: time in minutes from skin incision to closure in minute/.

Time to First Analgesia Request: A time in minutes from the end of surgery to first time analgesia were given.

Total analgesia consumption: the total of analgesia given within the first 24 hours after the end of surgery.

Postoperative: Time immediately after surgery.

Post-operative nausea and vomiting: when a patient's experience at least one episode of either nausea or vomiting within 24 hours.

Nausea and vomiting was assessed, and patient was given score according to nausea and vomiting score described by McDonnell *et al*. (18)

0 - No nausea/vomiting in past 24 h

1 - Nausea in past interval

2 - Vomiting in past interval

ASA status: is a surgical risk stratifications validated by American Society of Anesthesiologist; described as follows:

ASA I: a healthy patient with no organic/physiological/psychiatric problems.

ASA II: controlled medical conditions with mild systemic effect and no limitation of functional ability.

ASA III: medical condition with severe systemic effect, limitation in functional capacity.

ASA IV: poorly controlled medical conditions associated with significant impairment in functional ability that is potential threat to life.

ASA V: critical condition, little chance of survival without surgical procedure

ASA VI: brain dead patient undergoing organ donation

CHAPTER FIVE: RESULTS

5.1 **Demographic and peri-operative Characteristics**

During the study period, a total of 58 patients were included for final analysis based on whether they received TAPB with Perineural dexamethasone or TAPB alone at the end of surgery for postoperative analgesia, in patient underwent cesarean section under spinal anesthesia. There was no statistical significant difference between two groups with regard to age, height, weight, BMI, Gravidity, ASA physical status (P value > 0.05) as shown in Table 1.

	Group TAP D N=29	**Group TAP A N=29**	**P-value**
Age (year)	28.44 ± 2.81	26.41 ± 3.407	0.211
Height (m)	1.61 ± 0.0402	1.59 ± 0.0385	0.698
Weight (kg)	71.06 ± 6.803	69.48 ± 6.21	0.40
BMI (Kg/m^2)	25.92± 2.046	25.969 ± 2.461	0.831
ASA I/II	23/6	25/4	0.171
Operation surgery (min)	48 ± 7.64	45± 5.85	0.131
Gravidity			
One	8	11	0.158
Two	18	13	
Three and above	3	5	

Value are presented as: Mean +SD, Number (%), independent T-test, chi-square test and p<0.05 is statistically significant.

Table 1** **Demographic and peri operative Characteristics

5. 2 Comparison of time to first analgesia request and total analgesia consumption between groups

The Mann Whitney U test showed that the median time to first analgesia request in minutes were longer 510 minutes in TAP with Perineural dexamethasone group compared to median time to 310 minutes in TAP alone group with p-value <0.001.as shown in table 2

	Group TAP D N= 29	**Group TAP A N=29**	**P-value**
First analgesic requirement time (minutes)	510(503.58-587.58)	318(313.51-335.48)	<0.001*
Total analgesics consumption			
o **Tramadol in mg (IV)**	50(37.82-62.52)	100(69.77-88.84)	0.001*
o **Diclofenac in mg (IM)**	75(42.31-71.47)	75(73.91-91.60)	0.003*

Table 2: Comparison of time to first analgesia request in minutes and total analgesia consumptio over 24 Hours

IQR – Interquartile range , * = statistically significant, TAP D –Transverse abdominis plane + dexamethasone, TAP A -Transverse abdominis plane without dexamethasone.

With regard to postoperative total analgesic consumption, there were statistical significant difference in median Diclofenac and tramadol (in milligram) consumption within 24 hours between the two groups with p <0.003 and <0.001 respectively.

5. 3 Comparison of Postoperative Pain Severity by Numeric Pain rating scale

The Mann Whitney U test revealed that a significant reductions in median NRS score at 6th, 12th and 24th hour in TAP block with dexamethasone group as compared to TAP alone group with p value 0.001, 0.001 and 0.016 respectively. But there was no significant difference result at 2nd and 4th hour between two group with p>0.005.

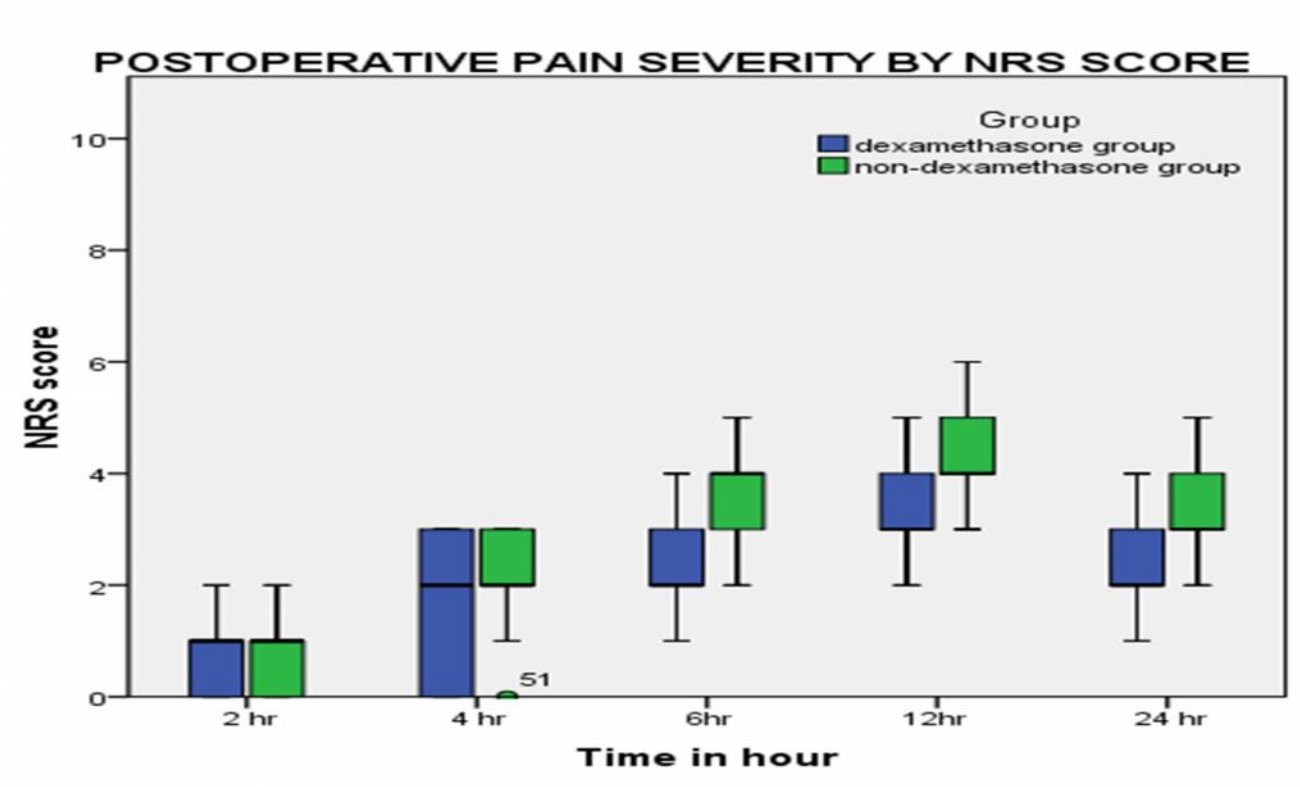


Figure III Postoperative pain severity by NRS score.

5.4 Incidence of Nausea and Vomiting

The incidence of postoperative nausea and vomiting was 27.5%. The proportions of patients with nausea and vomiting was significantly lower 1/29(3.4%) in TAP with dexamethasone group as compared to 7/29 (24.1%) in TAP alone group with p<0.04.

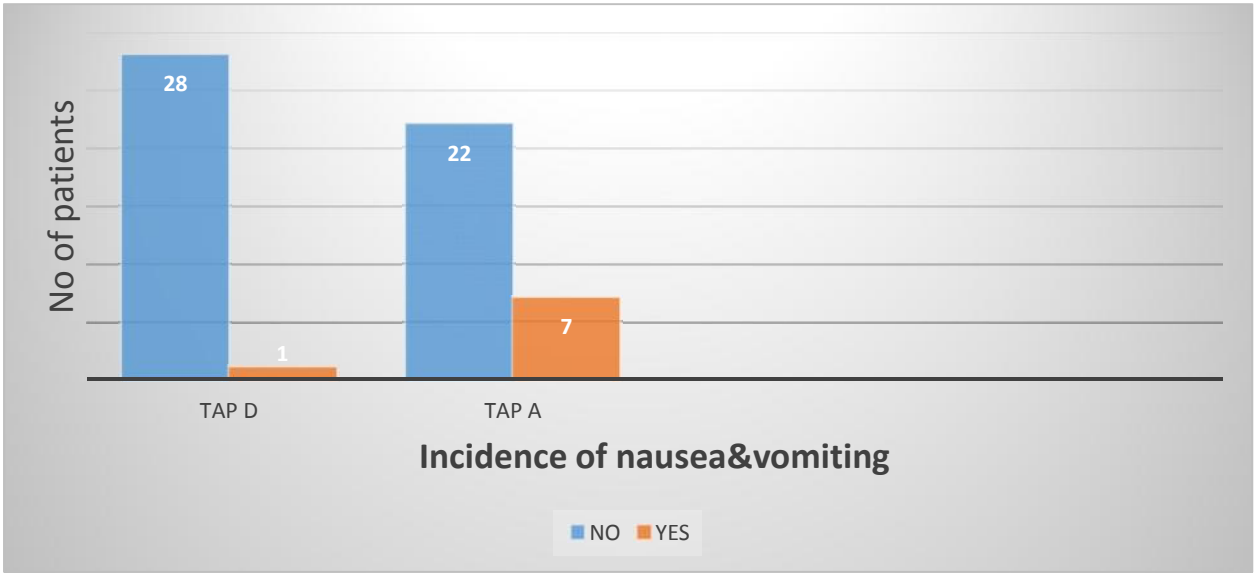


Figure IV: Incidence postoperative nausea and vomiting

CHAPTER SIX: DISCUSSION

In our study, bilateral TAP D (Transversus abdominis plane block with 8mg Perineural dexamethasone) significantly decrease postoperative pain, reduced total analgesic consumption, and prolonged the median time to first analgesic request in postoperative period after cesarean section under spinal anesthesia when compare to TAP A (Transversus abdominis plane block alone)

We found that the median time for the first analgesic request was significantly prolonged in TAP D block group median time 510min/ 8.5 hour, 95% CI: [8.47- 9.79] versus TAP A group, median time 318min/ :5.3hour, 95% CI: [5.23- 5.59] (p=0.00). Similar study done by Amany S et al in Egypt (2016) shows that the mean time for first analgesia request after abdominal hysterectomy was longer in (min) 459.8±75.3 TAP D group as compared to 325.4±63.6 in TAP A group (p=0.002).(40)

This finding also supported, by study conducted in India by Jasleen Sachdeva et al with mean time to first analgesia request after cesarean section under spinal anesthesia with ropivacaine was significantly longer in TAP D Group (5.92 ± 1.02 hr. vs. 3.11 ± 0.82 hr.) TAP A respectively with (P = 0). (41)

Our study in line with prospective randomized controlled trials done in turkey, by A. Akkaya et al shows that the time to first analgesia request after cesarean section under spinal anesthesia was significantly prolonged in TAP D group, mean time: 13 ± 7.8 hour versus TAP A group mean: 6.1 ± 4.8 hour (p= 0.001). However, longer time difference occurred was due to use of levobupivacaine and difference in concentration and techniques that has been used. (43)

Another study that in line with our study was, meta-analysis done in china (2018) by Qi Chen et al, on effectiveness of Perineural dexamethasone as adjuvant on TAP block time to first analgesia request, Dexamethasone prolonged the block duration by 2.98 hr. (95% CI: 2.19 to 3.78; I2 = 95%; P<0.00001) from a baseline of 5.34 hr. without dexamethasone.(51)

In our study, there was significantly reduced post-operative pain (NRS score) in TAP D group at 6th, 12th and 24th hour as compared to TAP A group and there was no significant difference at 2nd and 4th hour between two group. The possible justification existing significant difference NRS score between the groups was at 6th hour, it's the time to first analgesia request for most of TAP A

group and the block started to be dense in case of TAP D group. At 12th and 24th it's time to request additional analgesia and analgesia lasting time in both respectively.

Our study result is comparable with study done by Jyoti P. Deshpande they were found that there is statistically significant difference of VAS score in the two group at 6 hour (4.57±2.58) versus (2.38±1.32) (p= 0.001) and 12 hour (3.86±1.67) versus (3.10±1.32) (p=0.005) in TAP A and TAP D group respectively (38) this finding was also supported by other studies (40, 42, 43)
In contrary to our study a study done by Amany S et al found that statistically significant in pain score at 2 hour and 4 hour post-operative hour in TAP D group as compare control group with (p= 0.001) in both groups. (40) The possible explanation was type of anesthesia, the block is given following general anesthesia, in our study under spinal anesthesia and there might be prolonged block with spinal.

Our study also contrary with previous meta-analysis done by Jasleen Sachdeva et al found that there is no statically significant pain score at 24 hour post operatively (50). The possible explanation was the TAP block was done following different surgery and type local anesthesia was used and plus to that the technique and concentration of drugs used was varies.
The median (interquartile range) 24 hour total Diclofenac was significantly reduced in TAP D group as compared to TAP A group these was 75mg (42.31-71.47) versus 75mg (73.91-91.60) (p=0.003) respectively.

According our study, median of total Tramadol consumption within 24 hour is 50(37.82-62.52) milligram in TAP D group as compare to 100(69.77-88.84) milligram in TAP A group (p=0.001). Similarly the previous study done by Jyoti P. Deshpande, shows that the mean total tramadol consumption in TAP D group was 50.2±34 (mg) and 94.0±35 (mg) in TAP A group (p=0.001). (38)
Another study that is line with our study is study conducted by Jasleen Sachdeva et al show that the time for 24 hour total tramadol consumption is significantly reduced in TAP D group as compared to TAP D with mean of 100.00±0.00 and 140.00±50.26 (p=0.046) respectively(40). This study also supported by other studies (39, 42, 51).

As regard to postoperative nausea and vomiting incidence was lower in TAP D group with proportion of 3.4% as compared to 24.1% in TAP A with (p=0.04). This finding was comparable with previous study done by Jasleen Sachdeva et al with incidence of post-operative nausea and vomiting is 2.8% in TAP D group and 17.1% in TAP A group with (p=0.023).(41)

Another study in line with our is meta-analysis done in china (2018) by Qi Chen et al shows that the incidence of nausea and vomiting was 72% lower in patients who received TAPB with Perineural dexamethasone than in patients who did not receive Perineural dexamethasone (95%CI: 0.16 to 0.49; I2 = 0%; P<0.00001) (51).

Limitation

This study has certain limitations, including: limitation of similar for discussion and most of studies we used for comparison was randomized control trials.

Strength

We have tried to make comparable study groups in terms of socio demographic distribution, perioperative factors that affect study outcome and the same surgical procedure so that the difference observed may be due to exposure factors.

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATION

Conclusion

We concluded that Perineural 4mg dexamethasone added to bilateral TAP block with 20ml of 0.25% bupivacaine prolonged time to first analgesia request, decrease total 24hour analgesic consumption and postoperative pain severity score till 24 hour postoperatively.

Recommendation

According to the finding of the study, we recommend the use of Perineural dexamethasone as additive to bupivacaine TAP block after cesarean section for postoperative pain as part of multimodal analgesia.

Hospital: we recommend to give training on transversus abdominis plane block with Perineural dexamethasone for staffs and incorporate it as multimodal analgesia for postoperative pain management.

We also recommend additional randomized control trial to evaluate the safest routes for dexamethasone administration as adjuvant.

REFERENCE

1. Arulkumaran S Obstetric Proceeding: in Dewhurst's Textbook of Obstetrics and Gynecology. In: D Keith editor. 7th ed. United States: Edmonds Blackwell publishing (2007)
2. Betrán AP, Ye J, Moller A-B, Zhang J, Gülmezoglu AM, Torloni MR The Increasing Trend in Caesarean Section Rates: Global, Regional and National Estimates: 1990-2014. (2016) PLoS
3. Hiwot Tsegaye. Biranu Desalegn. Yohannes Ayalew: prevalence of cesarean section and associated factor in Addis Ababa hospitals. Addis Ababa 2017.
4. Jørgensen H, Wetterslev J, Møiniche S, Dahl JB (2000) Epidural local anaesthetics versus opioid-based analgesic regimens on postoperative gastrointestinal paralysis, PONV and pain after abdominal surgery. Cochrane Database Syst Rev (4): CD001893.
5. Carney J, McDonnell JG, Ochana A. The transversus abdominis plane block pro- vides effective postoperative analgesia in patients undergoing total abdominal hysterectomy. AnesthAnalg 2008; 107:2056-2060.
6. McDonnell JG ,O'Donnell BD,Farrell T,Transversusabdominis plane block: a cadaveric and radiological evaluation. RegAnesth Pain Med. 2007 Sep-Oct; 32(5):399-404.
7. Yarwood J, Berrill A. Nerve blocks of the anterior abdominal wall. Cont Edu Anaesth Critical Care Pain 2010; 10(6):182–6
8. Rafi AN. Abdominal field block: a new approach via the lumbar triangle. Anaesthesia.2001; 56(10):1024–1026
9. Gadsden J, Hart S, Santos AC. Post-cesarean delivery analgesia. AnesthAnalg 2005; 101 Suppl: S62-9.
10. Vieira PA, Pulai I, Tsao GC, Manikantan P, Keller B, Connelly NR. Dexamethasone with bupivacaine increases duration of analgesia in ultrasound-guided interscalene brachial plexus blockade. Eur J Anesthesiology 2010; 27:285-8.
11. Farragher RA, Laffey JG. Postoperative pain management following cesarean section .In: ShortenG, CarrD, HarmonD, Etal. Eds. Postoperative pain management: an evidence-based guide to practice. 1st ed. Philadelphia, PA: Saunders Elsevier, 2006:225–3
12. G Edward Morgan, Jr Maged, S Mikhail, Michael J. Murray. Clinical Anesthesia.USA:

McGraw-Hill Companies, 2006, 4thed.

13. Barash P, Cullen Bruce F, Stoelting Robert K, Cahalan Michael K, Stock Christineb M. Clinical anesthesia. Philadelphia: Lippincott Williams & Wilkins; 2009
14. Sng BL, Sia AT, Quek K, Woo D, Lim Y. Incidence and risk factors for chronic pain after caesarean section under spinal anaesthesia. Anaesth Intensive Care. 2009; 37(5):748-52.
15. Twersky R, Fishman D, Homel P (1997) what happens after discharge? Return hospital visits after ambulatory surgery. Anesth Analg 84: 319-324.
16. Biluts H, Bekele A, Kottiso B, Enqueselassie F, Munie T (2009) In-patient surgical mortality in Tikur Anbessa Hospital: a five-year review. Ethiop Med J 47: 135-142
17. De Brito Cançado TO, Omais M, Ashmawi HA, Torres MLA. Chronic pain after cesarean section. Influence of anesthetic/surgical technique and postoperative analgesia. Brazilian Journal of Anesthesiology. 2012; 62(6):762–74.
18. McDonnell JG, O'Donnell B, Curley G, Heffernan A, Power C, Laffey JG. The analgesic efficacy of transversus abdominis plane block after abdominal surgery: A prospective randomized controlled trial. AnesthAnalg. 2007; 104(1):193–7.
19. McDonnell JG, O'Donnell B, Curley G, Heffernan A, Power C, Laffey JG. The analgesic efficacy of transversus abdominis plane block after abdominal surgery: A prospective randomized controlled trial. AnesthAnalg. 2007; 104(1):193–7
20. Y. Fujii, H. Toyooka, and H. Tanaka, "Efficacy of thoracic epidural analgesia following laparoscopic cholecystectomy," European Journal of anesthesiology, vol. 15, no. 3, pp. 342–344, 1998.
21. Gadsden J, Hart S, Santos AC. Post-cesarean delivery analgesia. AnesthAnalg 2005;101 Suppl:S62-9
22. Eman Ramadan Salama. Post-operative bilateral continuous ultrasound-guided transversus abdominis plane block versus continuous local infusion in patients undergoing abdominoplasty; Indian J Anesth.2018 Jun: 449-454.
23. . Almarakbi WA, Kaki AM. Addition of Dexmedetomidine to bupivacaine in transversus abdominis plane block potentiates post-operative pain relief among abdominal hysterectomy patients: A prospective randomized controlled trial. Saudi J Anaesth 2014; 8: 161-6.

24. Mannion S, O'Callaghan S, Murphy DB, Shorten GD. Tramadol as adjunct to psoas compartment block with levobupivacaine 0.5%: a randomized double-blinded study. Br J Anaesth 2005; 94: 352-6.
25. Sen S, Ugur B, Aydin ON, Ogurlu M, Gezer E, Savk O. The analgesic effect of lornoxicam when added to lidocaine for intravenous regional anaesthesia. Br J Anaesth 2006; 97: 408-13.
26. Clerc S, Vuilleumier H, Frascarolo P, Spahn DR, Gardaz JP. Is the effect of inguinal field block with 0.5% bupivacaine on postoperative pain after hernia repair enhanced by addition of ketorolac or S (+) ketamine? Clin J Pain 2005; 21: 101-5.
27. Movafegh A, Razazian M, Hajimaohamadi F, Meysamie A. Dexamethasone added to lidocaine prolongs axillary brachial plexus blockade. AnesthAnalg 2006; 102:263-7.
28. Cummings KC 3rd, Napierkowski DE, Parra-Sanchez I, Kurz A, Dalton JE, Brems JJ, et al. Effect of dexamethasone on the duration of interscalene nerve blocks with ropivacaine or bupivacaine. Br J Anaesth 2011; 107:446-53.
29. Parrington SJ, O'Donnell D, Chan VW, Brown-Shreves D, Subramanyam R, Qu M, et al. Dexamethasone added to mepivacaine prolongs the duration of analgesia after supraclavicular brachial plexus blockade. RegAnesth Pain Med 2010; 35:422-6.
30. Chong MA, Berbenetz NM, Lin C, Singh S. Perineural versus intravenous dexamethasone an adjuvant for peripheral nerve blocks: a systematic review and meta-analysis. RegAnesth Pain Med. 2017; 42: 319–326. https://doi.org/10.1097/AAP.0000000000000571 PMID: 28252523
31. Huynh TM, Marret E, Bonnet F. Combination of dexamethasone and local anesthetic solution in peripheral nerve blocks: a meta-analysis of randomized controlled trials. Eur J anesthesiology. 2015; 32: 751–758. https://doi.org/10.1097/EJA.0000000000000248 PMID: 25774458
32. Choi S, Rodseth R, McCartney CJ. Effects of dexamethasone as a local anesthetic adjuvant for brachial plexus block: a systematic review and meta-analysis of randomized trials. Br J Anaesth. 2014; 112: 427–439. https://doi.org/10.1093/bja/aet417 PMID: 24413428
33. Huang SH, Lu J, Gan HY, Li Y, Peng YG, Wang SK. Perineural dexamethasone does not enhance the analgesic efficacy of ultrasound-guided subcostal transversus abdominis plane

block during laparoscopic cholecystectomy. HepatobiliaryPancreat Dis Int. 2016; 15: 540–545. PMID: 27733325

34. Wegner R, Akwar D, Guzman-Reyes S, Pednekar G, Chaudhry R, Grewal N, et al. evaluating the a adjuvant effect of dexamethasone to ropivacaine in transversus abdominis plane block for inguinal hernia repair and spermatocelectomy: a randomized controlled trial. Pain Physician. 2017; 20: 413–418. PMID: 28727704
35. S Choi, Rodseth, and C J McCartney et al. Effect of dexamethasone as a local anesthetic adjuvant for brachial plexus block a systematic review and meta-analysis of randomized trials Br J Anaesth. 2014 Mar 1,112(3).427-39.
36. Tarekegne F, Eshete S and Moges K. Efficacy of Transversus Abdominis Plane (TAP) Block as Part of Multimodal Analgesia after Cesarean Section Delivery. J Anesth critical care, 2015; 3(3)
37. GajananMM, PravinSS, and SachinPG. Ultrasound-guided transversus abdominis plane Block for post-operative analgesia in patients undergoing caesarean section. Indian J Anaesth. 2016 Apr; 60(4): 253–257.43. Tarekegne F, Eshete S and Moges
38. Gordon G. The role of dexamethasone in peripheral and neuraxial nerve blocks for the management of acute pain. Southern African journal of anaesthesia and analgesia. 2016; 22(6):1639.
39. Deshpande JP, Ghodki PS, Sardesai SP. The analgesic efficacy of dexamethasone added to ropivacaine in transversus abdominis plane block for Tran's abdominal hysterectomy under subarachnoid block. Anesth Essays Res 2017; 11:499-502.
40. Amany S Ammar, Khaled M. Mahmoud: Effect of adding Dexamethasone to bupivacaine on transversus Abdominis plane block for abdominal hysterectomy: A prospective randomized controlled trail. Saudi J Anaesth.2012 Jul-Sep; 6(3): 229-233.
41. Sachdeva J, Sinha A. Randomized controlled trial to study the effect of dexamethasone as additive to ropivacaine on duration of ultrasound-guided transversus abdominis plane block in cesarean section. Indian J Pain [serial online] 2016 [cited 2018 Aug 18]; 30:181-5. Available from: http://www.indianjpain.org/text.asp?2016/30/3/181/198056
42. Hisham Ahmed Fouad, Amal Mohammed Sabry Ahmed, Yasser Mohammed Osman, Gamal Mohammed Taha Abouelmagd. Efficacy of preemptive dexamethasone added to bupivacaine in ultrasound guided transversus abdominis plain block for postoperative

analgesia after inguinal herniorraphy. American Journal of Research Communication, 2016, 4(5): 27-42} www.usa-journals.com, ISSN: 2325-4076

43. Akkaya A, Yildiz I, Tekelioglu UY, Demirhan A, Bayir H, Ozlu T, et al. Dexamethasone added to levobupivacaine in ultrasound-guided transversus abdominis plain block increased the duration of postoperative analgesia after caesarean section: a randomized, double blind, controlled trial. Eur Rev Med Pharmacol Sci. 2014; 18: 717±722. PMID: 24668714
44. Kopacz DJ, Lacouture PG, Wu D, Nandy P, Swanton R, Landau C. The dose response and effects of dexamethasone on bupivacaine microcapsules for intercostal blockade (T9 to T11) in healthy volunteers. AnesthAnalg 2003; 96: 576–8
45. Raghukumar Mamatha, Sagar Siddanagouda Majigoudar. A randomized clinical comparative trial to study the efficacy of adding clonidine or dexamethasone to bupivacaine (0.5%) in prolonging the duration of post-operative analgesia with ultrasound guided TAP block in cesarean section delivery. Indian journal of clinical anesthesia 2017; 4(2): 198-201.
46. Laxman Bhagwanrao Poulkar, Vaishnavi V Kulkarni, Pushpa I Agrawal. Caudal anaesthesia in paediatric patients: Comparison of analgesic efficacy between ropivacaine and bupivacaine. MEd Pulse International Journal of Anesthesiology. October 2017; 4(1): 10-14. http://medpulse.in/Anesthsiology/index.php
47. Abdalla W. Ultrasound-guided transversus abdominis plane block for radical cystectomy with and without dexamethasone: a prospective, double-blinded controlled trial. Ain-Shams J anesthesiology 2014; 7:539-44
48. Dr. Ankesh1. Comparative evaluation of 0.25% Levobupivacaine and 0.25% Ropivacaine in Transversus abdominis Plane block for postoperative analgesia following lower segment caesarean section: a prospective, double-blinded controlled trial. Journal of Dental and Medical Sciences. Volume 17, Issue 5 Ver. 12 (May. 2018), PP 58-62 p-ISSN: 2279-0861.
49. Arzu Yıldırım Ara. Ultrasound-guided transversus abdominis plane block in patients undergoing laparoscopic cholecystectomy: comparison of efficacy of bupivacaine and levobupivacaine on postoperative pain control Firdevs Karadoˇgana, Damla Kırıma, Fatma Nur Akgüna, https://doi.org/10.1016/j.bjane.2018.02.001
50. Panagiotis Theodosiadis, Nick Sachinis,Teo Goroszeniuk, Vasilios Grosomanidis,Byron Chalidis, ropivacaine versus bupivacaine for 3-in-1 block during total knee arthroplasty, double-blinded controlled trial. Journal of orthopedic surgery 2013; 21(3); 3004-4.

51. Chen Q, An R, Zhou J, Yang B Clinical analgesic efficacy of dexamethasone as a local anesthetic adjuvant for transversus abdominis plane (TAP) block: A meta-analysis. PLoS ONE (2018) 13 (6): e0198923. https://doi.org/10.1371/journal. pone.019892

ANNEXES

Annex: I Assurance of principal investigator

I the undersigned agree to accept responsibility for the scientific ethical and technical Conduct Of the research project and for provision of required progress reports as per terms and conditions Of the Research Publications Office in effect at the time of Grant is forwarded as the result of this Application.

Name of the principal investigator:

Date. .February, 2018 Signature _____

Name of the advisor:

Date. . February, 2018 Signature _____

Annex: II Information sheet

Hello.

My name is _____. I

Am a researcher and I have been attending postgraduate program in the field of Anesthesia at Addis Ababa university. I am going to conduct research on the effect of Perineural dexamethasone as additive to bupivacaine on transverse abdominis plane block for post-operative analgesia in elective cesarean section under spinal anesthesia at black lion specialized hospital from September to February 2018/2019. The information going to be obtained will help the government and other responsible bodies to decrease in morbid adverse events after surgery and patient satisfaction. Your participation is very valuable for the success of this project. Also be mindful that whatever we will get here is for research purposes only and the information will not be used by any other person apart from this research and therefore, confidentiality can be guaranteed. However, your names will not be mentioned or be attached to anything that you say.

Do you want to continue yes---------- No---------- (Thank you in advance for your help!)

Name and contact address of investigators

Abdisa Aga Email abdisaasa86@gmail.com Cell phone +251-923961658

Identification card no. ----------

Annex III: Amharic information sheet

የ መ?ይቅ ፈ,ቃድ፤

ጠፍ ይስጥልኝ !

እኔ_____

እባላለሁ፡ ፡ በአዲስአበባዩኒቨርሲቲ፡ አንስቴዚያትምህርትክፍልሚስጥ £ሀለተf ድግሪ መሚi¦ ¼~rእየ ሰራሀእገኛለሁ፡ ፡ ¼~ቱ£ሚያክረወክሜረግለዎትቀዶጥግ ናበኋላስለሚመዎትየ ሆድ ህማመ መን የ ተዉሰኑ ጥያቄዎችንልጠይቅዎትእፈልጋለሁ፡ ፡ የ ዚህ መ?ይቅዋናዓላማከአፕራሲያን በሃላ በሚጥ ህማመማ,ታግ ሻ ምን ¦Cል ህማማ እንደስ,ታግ ሰለት ለመ£i ^Dን እርስዎ ከጥናቱ የ ሚርስቦት ጉዳትየ ለም፡ ፡ ˆንደወም ከዚህ በኋላ በአፕራሲያን ለሚኑትክክለኛወን የ ህማመማ,ታግ ሻ በማሚጥየ ,ካማሚቾን እርካ,ታለመኛመ ¨ጠቅሜ፡ ፡

ለመ,ተፍፈ ,ቃደኛነ ዎት?

ሀ/ አዎ ፊርማ_____

ለ/ አይደለሀም

ለማኛወመጀነ ሱትጥያቄካለዎትተሚሚሚወጓበሚጥለወአደራሻማ ,ጋገ ርይቻላል፡ ፡

ለመ,ተፍፈ,ቃደኛስለሆኑእናመ,ግናለን!!

ስልክቁጥር - +251916438930 ኢሜይሌ- abdisaaga8@gmail. Com

Client card No._____operation date_____

. Annex IV Questionnaire

Questioner developed for collection of data for the study, effect of Perineural dexamethasone as additive to bupivacaine on transverse abdominis plane block for post-operative analgesia in elective cesarean section under spinal anesthesia at black lion specialized hospital from September to February 2018/2019.

Section: 1 Socio demographic factors

S.no	Question	Response	Code
101	Patient card no		
102	Patient age(yrs.)		
103	Body Weight (k/g)		
104	Height		
105	BMI		
106	ASA status	ASA I	1
		ASA II	2
107	Gestational age(weeks)	< 34 wks	1
		34 – 37wks	2
		37 – 40 wks	3
108	Gravidity	One	1
		Two	2
		Three	3
		Four	4
		Above specify	5
109	Allergy to any of the followir drugs	Diclofenac	1
		Opioids	2
		Local anesthetics	3
		steroids	4
		Unknown	5
		Others specify_____	6

Section 2.Data during peri-operative period

S.no	Question	Response	Code
101	Base line Heart rate	_____ bpm	
102	Base line Blood pressure(MAP)	____/____(____) mmhg	
103	Base line RR & spo2	_____br/m &_____%	
104	Does the patient receive ar premedication?	Yes	1
		No	2
105	If Yes specify type and dose	1. _____(_____mg) 2. _____(_____mg)	
106	Dose of 0.5% bupivacaine used for SA	_____ mg	
107	Additives to local anesthetics	Yes	1
		No	2
108	If yes, specify type and dose	_____ (_____mg/mcg)	
109	Any additional analgesic drug require and given intraoperative?	Yes	1
		No	2
110	If Yes .specify type, time and dose of dru given	_____ (____mg	
111	Type of incision	Pfannenstiel	1
		Vertical	2
112	Duration of surgery	25 – 35 minute	1
		35 – 45 minute	2
		Above 45 minute	3
113	A drug used for the TAP block?	1 …….(ml) bilateral 0.25 bupivacaine only or 2 ……..(ml) bilateral 0.25 bupivacaine wit ……..(mg)dexamethasone	

Section 3. ***Postoperative Hemodynamic status of the patient***

S.no	V/S	Immediately a Arrival of Recover Room	2nd hr. po op	4th hr. po op	6th hou post op	12th hou post op	24th hou post op
01	Time (loca PM/AM						
02	SBP						
03	DBP						
04	MAP						
05	PR (bpm)						
06	SPO2 (%)						
07	NSR score						

Section 4. Time to request first analgesia

01. Duration in minutes till Initial analgesic requirement after the patient arrived in the recovery

A) Arrived at _____ in local time pm/am {time per 24hr/date/month/ETH .year}

B) Analgesic required time _____ in local time PM/AM {timeper24hr/date/month/ yr.}

C) Duration till first analgesic request _____ min.

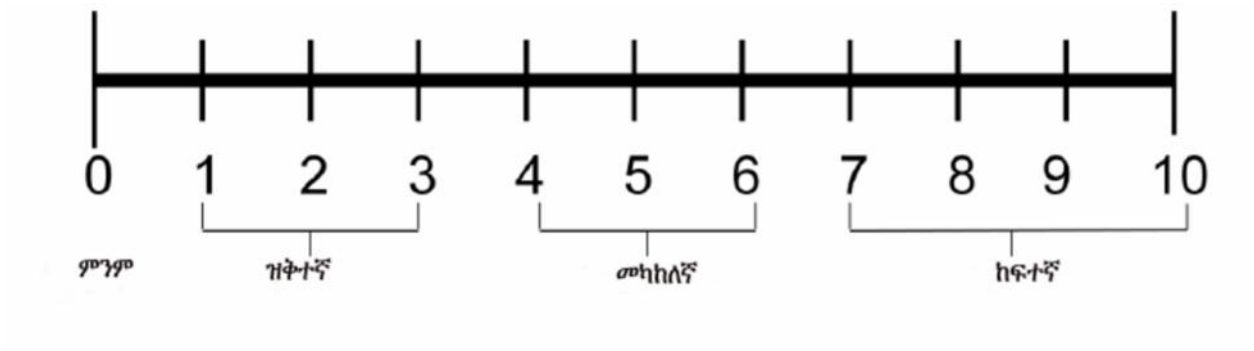
Section 5.Total analgesia consumption for 24hr.

Questions	Possible answers(mg/mcg)	Code
Diclofenac		1
Tramadol		2
Fentanyl		3
Morphine		4
Others		5

01. Does the patient have nausea within the first 24 hours of surgery? A. Yes B. No
02. Does the patient develop vomiting within first 24 hours of surgery? A. Yes B. No

አሚርኛ ትርጉም

በቁጥር አምሳያ መለኪያ (NRS)



1. ይህ መለኪያ በመጀመሪያው24 ሰአት 7 ጊዜ የሚሰድሰሆን.

a. በሽተኛዉ ሚዛየ ቃቸዉያቄዎች

i. አሁንየ ሚመዎትንህመማየ ትኛዉቁጥርይወክሉታል ;

ii. ከዜሮእስከአስርካሉትቁጥሮችአሁንየ ሚመዎትንህመማዉ ትኛዉቁጥርይገ ልፀዋል ;

2. ከላይያ ተሰጠመግለሪያበቂሳይሆንሲቀር፣ ለበሽተኛዉ በለጠየቂጀመልጠትአስፈላጊሆኖይገ ኛል

VNRS	**Possible answers**	CODE
VNRS (ምድባዊየ ህመምመለኪያ)	1. No pain (ምንምየ ህመምስሜየ ለም(0) 2. Mild pain (ጥቂትየ ህመማስሜአለ (1-3) 3. Moderate pain (መካከለኛየ ህመማስሜአለ (4-6) 4. Severe pain (ከፍተኛየ ህመማስሜአለ (7-10)	

Thank you for your participation!