

THREE YEARS RETROSPECTIVE ANALYSIS ON TYPE OF ANESTHESIA ADMINISTERED FOR PATIENTS WHO UNDERWENT LOWER ABDOMINAL SURGERY IN ADAMA REFERAL HOSPITAL.

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JIMMA, ETHIOPIA

JIMMA UNIVERSITY

COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCE

DEPARTEMENT OF ANESTHESIA

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ABSTRACT

BACKGROUND: General anesthesia and regional anesthesia are the type of anesthesia for lower abdominal surgery. each type of anesthesia usage depends on different factors. In Ethiopia, even though there were many researches done on surgical procedures, they failed to address the type of anesthesia administered for lower abdominal surgery.

OBJECTIVES: The objective of this study is to assess type of anesthesia given for patients who undergone lower abdominal surgery in Adama referral hospital from September 1, 2002-paugme 5, 2004E.C.

METHODS: A retrospective cross sectional design based on retrospective record review of type of anesthesia administered for patients who underwent lower abdominal surgery. The sample size was 384 and simple random sampling technique was used to select the study population. Questionnaire was prepared and the anesthesia record was collected from 384 anesthesia charts. The data was entered in to a computer and analyzed.

RESULT: From 384 major lower abdominal surgeries done, majority of lower abdominal surgery done was C/S (32.8%) and Prostatectomy is the second most common major lower abdominal surgery in the study period (27.6%). GA (ETT) was the common type of anesthesia both at elective and emergency period.

CONCLUSION: General anesthesia (ETT) was the most widely used type of anesthesia for patients who underwent lower abdominal surgery. The rate of spinal anesthesia for major lower abdominal surgery was less frequent. From the lower abdominal surgeries C/S constitute the highest proportion in this study area and period.

RECOMMENDATION: The anesthetist better practices to reduce the frequency of GA, which in turn reduces the complications that follow GA and increase the frequency of SA.

Keywords: type of anesthesia, lower abdominal surgery and adama referral hospital.

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ACHRONYMS

ARH.....	Adama Referral Hospital
C/S.....	Cesarean section
DVT.....	Deep Venous Thrombosis
GA.....	General Anesthesia
GA (ETT).....	General Anesthesia with Endotracheal Tube
ICU.....	Intensive Care Unit
PACU.....	Post Anesthesia Care Unit
RA.....	Regional Anesthesia
SA.....	Spinal Anesthesia
SRP.....	Student Research Program

CHAPTER ONE

INTRODUCTION

Anesthesia is one of the important components of operative management of patients for various diseases for its use. There are several ways of administrations ranging from completely unaware of loss of sensation to localized area anywhere in the body .This includes ;general anesthesia with or without endotracheal tubes. Neuroaxial block (spinal, epidural) and local anesthesia regard less of their diversity. Application of these modalities depend on the type of surgery to be done, their availability, experience of applicators (anesthetists), patient s' condition, time of surgery and so on. (1, 4)

The suitable mode of anesthesia for lower abdominal surgery is general anesthesia, spinal and epidural anesthesia are the commonly used alternatives. The events of surgery may emergency or elective surgery. In elective surgery the correctable parameter like hemoglobin level, blood pressure, renal problem, liver problem, lung capacity are screened and brought up to the normal range. This will result in decreasing morbidity and mortality in elective surgery as compared to emergency surgery. (2)

Application of anesthesia in pediatric patients less than 5 years is very difficult especially neuro axial block (spinal, epidural) this needs special experience for its application and not without hazard for such lesion GA is preferred by most of the anesthetist. This study addresses the commonly used way of anesthesia in our set up, in spite of well established hospital. (3)

1.1 STATEMENT OF THE PROBLEM

Anesthesia drugs act at different level of nervous system for this obvious reason there are different way of anesthesia administration minimize unnecessary effect on the body. Most lower abdominal surgery are carried out by spinal and general anesthesia and every procedure have its own side effect of GA is very high and life threatening (5,11).

The study conducted in Crynecol in 9559 patients aimed at the incidence of side effects related to GA showed. DVT was 44%, pulmonary embolism 55%, pneumonia 39% at its conclusion this all side effects were preventable by spinal or epidural anesthesia (5, 12).

Anesthesia is mandatory for major lower abdominal surgery to be done at present time. there are different types of anesthesia all over the world. General anesthesia (GA) and regional anesthesia (RA) are the type of anesthesia given for lower abdominal surgery. Each type of anesthesia for surgical procedures depends on different factors. This are ; site of surgery, patient willingness, patient conditions, skills of the anesthetist, event of surgery and time of surgery. Patients presented with systemic disease like Asthma, Hypertension, and Sepsis is at risk of morbidity and mortality after anesthesia is administered (8).

Regarding the site of procedure specially for lower abdominal and lower extremity surgeries are at risk of morbidity and mortality at emergency period .It is reduced by using other type of anesthesia that is regional anesthesia which includes spinal anesthesia ,epidural anesthesia ,and local anesthesia(9).

Spinal anesthesia and epidural anesthesia are the commonly used type of anesthesia for lower abdominal surgery. Spinal anesthesia is one of the oldest valuable technique of regional anesthesia(RA) , it is the efficient of blocks in that , a small quantity of local anesthetic agent injected in to spinal subarachnoid space will cause a wide spread blockage of nerves . This type of anesthesia is one of the commonly used types of anesthesia in developing countries for adult surgical procedure but most popular in neonatal and infant surgery in developed countries since it needs a highly skilled anesthetist or anesthesiologist. Spinal and epidural anesthesia give good post operative pain control .But epidural anesthesia need highly skilled anesthesiologist to place epidural catheter and to identify the epidural space (9, 10).

Regional anesthesia would be expected to speed up patient's recovery because of minimization of systemic Anesthetics. It would provide excellent post operative analgesia and thus reduce need for opioids and risk of nausea. However RA also requires additional performance, time and technical skill and may introduce its own set of side effects such as urinary retention in spinal anesthesia (13).

1.2. SIGNIFICANCE OF THE STUDY

Inappropriate use of type of anesthesia is a common problem in Ethiopia, which needs judgment of Anesthetist (anesthesiologist) who should decide on some factors that lowers the patients' morbidity and mortality. Anesthetic drug are the most potentially hazardous drugs, If they are not used properly. So that through understanding on which type of surgery needs which type of anesthesia and extent of patient condition is very important .The different types of anesthesia administration cause mortality and morbidity difference. Time of anesthesia and hospital stay also depend on type of anesthesia.

In Ethiopia, even though there were many researches done on surgical procedures, they failed to address the type of anesthesia administered for lower abdominal surgery. This study tries to address choice of type of anesthesia needed depending on the type of surgery with regard to patient conditions and to inform the professionals towards usage of the right type of anesthesia. So anesthesia

professionals will use this study to avoid inappropriate choice of type of anesthesia for over all benefit of patients, and also this study will serve as base line for further study.

CHAPTER TWO

2 LITERATURE REVIEW

The common lower abdominal surgery performed under regional anesthesia includes cesarean section, vaginal hysterectomy and herniorrhaphy. Spinal anesthesia specially for cesarean section from the lower abdominal surgery allows the mother to remain awake and deliver the fetus with little anesthesia effect .In USA,70 healthy parturents underwent elective cesarean section were randomly allocated and selected to 67% general anesthesia with endotracheal tube ,and 33%spinal anesthesia under standard anesthetic and surgical condition .General anesthesia group the neonates were delivered with low APGAR score (35%).women of general anesthesia group needs additional systemic analgesia and sedation but the neonates delivered by spinal anesthesia were with good APGAR score (1,2).

In USA research done on a retrospective study of 29 infants presenting for lower abdominal surgery .A variety of extensive surgical procedures including small bowel resection and variety of genitourinary procedures were successfully performed .Spinal anesthesia was successful in all 10(66%) infants ,7(24%)of the patients done under GA(ETT) and 3(10%) of the patients done under GA(mask)(1).

Combined spinal and epidural anesthesia is potential option to general anesthesia for major abdominal surgery in developed countries .Spinal anesthesia has superiority in pain control intra operative and post operative time than general anesthesia for all abdominal surgeries(1,4).INGUINAL HERNIORRHAPHY, the most frequent operation and can be successfully performed, using general anesthesia. In DENMARK epidemiological data from both nationwide and large regional data base have found that general anesthesia is used in 65% of case, spinal anesthesia in 25% and local anesthesia in 10% of cases. General and spinal anesthesia remain the most popular anesthetic techniques for lower abdominal surgery including inguinal hernia repair at university based teaching program (2,4).Vaginal hysterectomy is also a lower abdominal surgery procedures done under spinal anesthesia .In Germany a research done on 93 patients underwent vaginal hysterectomy, (64%) patients were done under

spinal anesthesia .From this figure 10 of the patients i.e.6% needed systemic sedation and the remaining (36%)done under GA(ETT)(3). Comparative study in GA and spinal/epidural anesthesia was conducted in 9559 patients under gone major surgery. This study aimed at the main outcome(mortality) and major side effect. The result revealed the mortality was decreased by 1/3 in spinal anesthesia i.e(spinal,103/4871&GA,144/4688,),(p=0.006).From the major side effect on GA, DVT was 44%, pulmonary embolism 55% and pneumonia 39% .The study conducted revealed that neuroaxial block (spinal/epidural) decreased the mortality rate (5).

Post operative pain score and morbidity is also found to be different from neuroaxial block(spinal/epidural) from GA. Random selection of 60 women (30 spinal ,30 GA) underwent lower abdominal surgery .It shows ,pain score after 48 hours was found to be best for those patients underwent spinal anesthesia(6).

There is high benefit of spinal anesthesia in reducing postoperative pain and anesthetic related morbidity and mortality as well as perioperative cost and patients undergoing inguinal herniorrhaphy (7). Patients undergoing abdominal hysterectomy often have significant postoperative pain despite the use of concurrent multimodal pain strategies. Neuraxial anesthesia has opioid-sparing effects and may provide better postoperative recovery to patients when compared with general anesthesia. Our main objective in this study was to compare the effects of neuraxial and general anesthesia on postoperative quality of recovery after abdominal hysterectomy (13)

Study showed that the mean blood loss in epidural/general anesthesia group was significantly lower in comparison with that of general anesthesia group (740+/-210 ml versus 1150+/-290 ml, P<0.001). In addition, less allogeneic blood was transfused in epidural/general anesthesia group: 0.19 blood units transfused versus 0.52 blood units in general anesthesia group (P=0.007). Our study proved that induced hypotension with epidural/general anesthesia reduced intraoperative blood loss and need of allergenic blood transfusions in cancer patient undergoing open radical prostatectomy (14)

The survey done on 532 obstetric units of university of Bonn Germany represent 46.9%of replies most hospitals 42.3 have delivery rate between 500-1000per years. GA is most common anesthetic technique for elective (65%) urgent (83%) and emergency C/S (98%)epidural anesthesia is performed in 23%of scheduled and 5%of non scheduled C/Sand in 14% and 10%respectively.(15)

According to cohort study done on 5320 children from 1998-2004in Minnesota, incidence of learning disability depends on mode of delivery .learning disability risk was similar in children delivered with general anesthesia but reduced in children receiving cesarean delivery with regional anesthesia (16)

According to the survey made on 621 obstetric units in 2005 in France the response rate was 73%.anesthetic technique were single shot spinal ,epidural, combined epidural and spinal and general in decreasing order (92.5%,4.5%,2%,&1%)respectively cricoids pressure and succinylcholine were routinely used in 66%and 77%of units respectively.(17)

CHAPTER THREE

3. OBJECTIVES

3.1 General Objective

To assess type of anesthesia given for patients who underwent lower abdominal surgery in ARH in the past three years.

3.2 Specific Objectives

1. To assess the type of anesthesia used in ARH for patient who underwent lower abdominal surgery.
2. To assess factors that determine the type of anesthesia administration for patient who underwent lower abdominal surgery.
3. To assess type of anesthesia given for elective and emergency lower abdominal surgery in ARH

CHAPTER FOUR

4. METHODS

4.1 Study area and period

The study was conducted in ARH which is found in east shewa of oromia part of Ethiopia, which is 98km from the capital city, Addis Ababa. Based on 2007 census the city has a total population 220,212. It is a referral hospital of east shewa zone (18).

The study was conducted on anesthesia records of patients who underwent lower abdominal surgery in ARH from 2002-2005 E.C.

4.2 STUDY DESIGN

A retrospective cross sectional study design based on retrospective analysis of the type of anesthesia administered for patients who underwent lower abdominal surgery in ARH from September 1, 2002-paugme 5, 2004 E.C

4.3 POPULATION

4.3.1 SOURCE OF POPULATION

The source population was clinical record, of all patients who underwent abdominal surgery in ARH

4.3.2 STUDY POPULATION

The study population was clinical records of all patients who were underwent lower abdominal surgery within the study period.

4.4 SAMPLE SIZE AND SAMPLING TECHNIQUE

The sampling size is determined by the formula

$$N = z^2 \frac{p(1-p)}{D^2}$$

D2

where; n= the minimum sample size

Z= Value of standard normal variable N=

$$(1.96)^2(0.5)(0.5)$$

at 95%

(0.05)²

N = 384

confidence level (1.96)

p= an estimate of prevalence rate of type
of Anesthesia administered (50%)

D= margin of error (5%)

Simple random sampling technique was used to select the study population

4.4.1 INCLUSION AND EXCLUSION CRITERIA

Patient cards with full information like identification, type of anesthesia administered, event of surgery, patient's condition including of elective and emergency case were included and those with poor recording were excluded.

4.5 DATA COLLECTION TOOL

Questionnaires format was prepared in English language which used to gather data such as identification, preoperative condition, type of anesthesia for specific surgical indication from clinical records.

4.6. VARIABLES

4.6.1 INDEPENDENT VARIABLES

☐ Age

☐ Sex

4.6.2 DEPENDANT VARIABLES

☐ Types of anesthesia

☐ Type of surgery

☐ Duration of surgery

☐ Preoperative assessment

☐ Events of surgery

4.7 DATA COLLECTION PROCESSE.

The card was collected and arranged according to their order, and then the questionnaire was filled by ARH Anesthetist after 30 minute training is given on how to extract the necessary information from the chart depending on each variable.

4.8 DATA QUALITY CONTROL

Orientation on data collecting instrument, objectives of the study and on how to facilitate data collection. Training was given by principal investigator for 30 minute. after each day of data collection the check lists were collected from the data collectors by principal investigator and stored appropriately, the collected data was checked for consistency and accuracy.

4.9 DATA PROCESSING AND ANALYSIS

The data was entered in to a computer and analyzed for determination of frequency and percentage. .

4.10 ETHICAL CONSIDERATIONS

The formal letter was written by Jimma University and sent to ARH medical director. After the department permission previous anesthetics charts was obtained. . It was assured that everything about patients matter kept confidentially and patients name would not be used. Information obtained was used only for study purposes and after completion of research, records were returned back to their original place.

4.11 DEFINITIONS OF TERMS

Anesthetist: Is a licensed professional to administer general as well as regional anesthesia to the Patient.

Duration of surgery: The time starting from incision to end of surgery (skin suturing)

Elective surgery: Is surgery done before on set (appearance) of any complication that might constitute Urgent indication.

Emergency surgery: Is surgery done in certain indications which need immediate interventions.

Epidural anesthesia: Administration of local anesthetic drugs in to the epidural space.

Events of surgery: the case emergency or elective before going to lower abdominal surgery.

Local anesthetic drugs: drugs in which undergo nerve blockage on the site of injection.

Lower abdominal surgery: Abdominal surgery done on below the umbilicus.

Major surgery: Surgery take more time and patients needs admission before time of surgery and need some criteria like blood loss >500ml.

Prostatectomy: Surgical removal of prostate gland through different techniques.

Regional anesthesia: Is type of anesthesia administered at site of action to undergo nerve blockage Using local anesthetic drug.

Spinal anesthesia: local anesthetics administered in subarachnoid space.

Vaginal hysterectomy: Removal of uterus through vaginal canal by surgical procedure

4.12 LIMITATION OF THE STUDY

- ☐ Poor hand writing and recording system on the operation note book.
 - ☐ Time constraint for computer service.
 - ☐ Some of the records were lost.
- ☐ Lack of few documentation of patient's information on the card.

4.13 DISSEMINATION OF RESULT

After finishing this research it will be disseminated to Jimma university SRP office then to college of public health and medical science and also to department of anesthesia The finding result was disseminated by sending copies of the research to research publication office, at last published and entered to Jimma University Library for reference of further study.

CHAPTER FIVE

RESULT

Table: 1 Age and sex distribution of patient who underwent lower abdominal surgery in ARH from september1, 2002-Paugme 5,2004E.C

Age	Sex	Total	%
	M		
	F		
	0-10		
	11-20		
	21-30		

31-40
 41-50
 51-60
 >60 16
 34
 34
 34
 28
 29
 6 25
 31
 46
 41
 35
 18
 7 41
 65
 80
 75
 63
 47
 13 10.7
 17
 21.1
 19.4
 16.5
 12.4
 3

Total 181 203 384 100

Among total of 384 patient card reviewed the majority of patients underwent Major Lower Abdominal surgery were in the group of 21-30 years 80(21.1%) followed by the age group 31-40 years in 75(19.4%)

From all major lower abdominal surgery done, a higher number of surgeries were done in females 203(53%) than male i.e. 181(47%) as shown on table 1.

Regarding the preoperative condition of patients most of elective cases were stable 233(60.67%) 75(19.5%) were preoperatively hypertension and 10(2.7%) were asthmatic the other were depicted in fig below.

Fig:1 Preoperative conditions of patients who underwent lower abdominal surgery in ARH from september1, 2002-Paugme 5,2004E.C
OTHERS: diabetic, epileptic, septic

Majority of the patients who underwent major lower abdominal surgery were done at elective period 264 (68.8%) and emergency surgery were 120(31.2%)

Fig:2 the event of surgery of patient who underwent lower abdominal surgery in ARH from september1, 2002-Paugme 5,2004E.C

GA (ETT) was the common type of anesthesia both at elective and emergency period. As shown in the fig below.

Fig:3 Type of anesthesia for emergency and elective lower abdominal surgery in ARH from september1, 2002-Paugme 5,2004E.C
Other; GAwith laryngeal mask airway

In the lower abdominal surgery majority of lower abdominal surgery done was C/S 125(32.8%) and Prostatectomy is the second most common major lower abdominal surgery done in the study period 105(27.6%) .

Fig:4 surgical indications for lower abdominal surgery done in ARH from september1, 2002-Paugme 5,2004E.C
Others; appendical abscess drainage,repair

From 384 of study subject 342(89%)of lower abdominal surgery were done under general anesthesia while spinal anesthesia consists only 35(9.1%) and also the rate of spinal anesthesia was higher in prostatectomy, whereas in cesarean section it was the lowest. the others are depicted in the fig below.

Fig:5 type of anesthesia administered for each type of lower abdominal surgery done in ARH from september1, 2002-Paugme 5,2004E.C.

Others; appendical abscess,repair

After surgery Majority of cases were admitted to ward where as less cases admitted to ICU(PACU), which is 337(88%) and 47(12%) respectively. the Others is as shown below.

Fig.6 Post operative admission of patient after lower abdominal surgery in ARH from september1, 2002-Paugme 5,2004E.C

Majorities of lower abdominal surgeries performed in the study period were accomplished in the time interval of 1-2 hrs 180(46.8%),Whereas the surgeries which took less than 1 hrs were less frequency 74. (19.2%).

Fig:7 the time duration of surgery for lower abdominal surgery in ARH from september1, 2002-Paugme
5,2004E.C

CHAPTER SIX

6. DISCUSSION

As the result of this study shows that the commonest types of anesthesia used for lower abdominal surgery was G/A (ETT). Especially for the surgeries performed in the lower abdominal and lower extremity surgery. Regards of the possibilities of use of local anesthesia to perform herniorrhaphy in some developed countries (4) in this study no use of local anesthesia for inguinal herniorrhaphy.

According to the result found there were no regional or local blocks used to perform major lower abdominal surgeries, as compare to the study conducted in Denmark where local anesthesia was used for 10% of the inguinal herniorrhephy successfully. This may be due to inconvenience of the anesthetist for duration of surgery (4, 7)

Female patients were the majority who underwent major lower abdominal surgery I.e. 53.3%. The higher number of female patient in the study hospital is due to higher number of obstetrics and gynecology surgery. Preoperative condition of the patient shows that most of the patient had no medical problems. The higher number of patients with stable medical condition is due to higher number of elective operation because in elective operation most of the patients are examined and treated for medical problems preoperatively.

The commonest lower abdominal surgery in this study was C/S and the mode of anesthesia administration was GA (ETT). The rate of spinal anesthesia in C/S in our study area was much less frequent than the study conducted in USA (33%) (9). this may be due to anesthetist preference for GA due to surgeon not waiting for spinal anesthesia to work.

There were 65% C/S done under GA, 23% under epidural anesthesia and 12% under spinal anesthesia according to the study done in Bonn Germany. The study done in France also shows anesthetic techniques used were single shot spinal, epidural, combined epidural and spinal and general anesthesia in decreasing order (92.55, 4.5%, 25, & 1%) respectively. In this study 90.81% and 9.19% cases were done under general anesthesia and spinal anesthesia respectively. (15, 17)

CHAPTER SEVEN

7. CONCLUSION AND RECOMMENDATION

7.1 CONCLUSION

Based on all the findings the following conclusion was made.

General anesthesia (ETT) was the most widely used type of anesthesia for patients who underwent major lower abdominal surgery. The rate of spinal anesthesia for major lower abdominal surgery was less frequent especially for C/S. There was no documented data for regional / local / nerve block anesthesia for major lower abdominal surgeries in the study period. And also there was no result showing that epidural anesthesia was used for any of lower abdominal surgery this is may be because of unavailability of epidural set and partly because of technique difficulty.

From the lower abdominal surgeries C/S constitute the highest proportion in this study area and period. Females underwent majority of lower abdominal surgery than male. Majority of Patients underwent lower abdominal surgery was in the age group of 21-30 years. Preoperative condition of the patient shows that greater number of patients with stabilized medical condition. of all most of the surgeries were accomplished in the time duration between 1-2 hrs. After surgery majority of cases of lower abdominal surgery was admitted to ward.

7.2 RECOMMENDATION

Based on all the findings the following recommendation was do for warded.

- ☒ For lower abdominal surgery spinal anesthesia should be used by the anesthetists according to preoperative medical condition of the patients at least at elective period.
- ☒ Elective cesarean section should be done by spinal anesthesia to increase the number of spinal anesthesia in this hospital.
- ☒ Surgery like Herniorrhaphy should done in the operation room under local anesthesia
- ☒ The department of anesthesia and hospital administration is recommended to encourage the anesthetists to use regional anesthesia based on the indication.
- ☒ The anesthetist better practice to reduce the frequency of general anesthesia which in turn reduces the complications that follow G/A and increase the frequency of SA.

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QUESTIONAIRES

JIMMA UNIVERSITY COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCE DEPARTEMENT Of ANESTHESIA;
questionnaires prepared about the type of anesthesia administered for patients who underwent lower
abdominal surgery in ARH.

1. Identification

a) Age

M

b) Sex

F

2. Preoperative condition

a) Stable b) Hypertensive c) hypotensive d) septic e) asthmatic

f) Others specify

3. The event of surgery

a) Elective b) Emergency

4. Type of anesthesia given

a) GA(mask) b) GA(ETT)

c) SA d) others specify _____

5. Type of lower abdominal surgery

a) C/S b) Vaginal hysterectomy c) prostatectomy

b) d) Herniorraphy e) others specify _____

6. Time duration of surgery a) <1hrs b) 1-2hrs c) >2hrs

7. Patients admission after surgery

a) ward b) ICU(PACU)