

CESAREAN SECTION PREVALENCE, INDICATIONS AND
MANAGEMENT OUTCOME IN METU KARL HOSPITAL, ILLU ABA
BORA ZONE, OROMIYA SOUTH WEST ETHIOPIA.



BY: - OMOD JOHN (BSc.)

A THESIS SUBMITTED TO JIMMA UNIVERSITY COLLAGE OF
PUBLIC HEALTH AND MEDICAL SCIENCE DEPARTMENT OF
INTEGRATED EMERGENCY OBSTETRICS& GYNAECOLOGY AND
GENERAL SURGERY FOR PARTIAL FULFILMENT OF DEGREE OF
MASTER IN INTEGRATED EMERGENCY OBSTETRICS&
GYNAECOLOGY AND GENERAL SURGERY.

JUNE, 2014

JIMMA, ETHIOPIA

JIMMA UNIVERSITY COLLEGE OF PUBLIC HEALTH AND MEDICAL
SCIENCE POST GRADUATE SCHOOL.

CESAREAN SECTION PREVALENCE, INDICATIONS AND
MANAGEMENT OUTCOME IN METU KARL HOSPITAL, ILLU ABA
BORA ZONE, OROMIYA SOUTH WEST ETHIOPIA.

BY: - OMOD JOHN (BSc.)

ADVISORS:-1. GARUMMA TOLU (MPH.)

2. KALKIDAN HUSSEN (MSc.)

JUNE, 2014

JIMMA , ETHIOPIA

Abstract

Background: - Cesarean section is a term commonly used in obstetrics to describe the delivery of a viable fetus through an incision on the abdominal wall and the uterus. WHO considers 5–15% Cesarean section rates of to be the optimal. However, access to safe Cesarean section estimated at 1–2% in sub-Saharan Africa. Four indications for cesarean delivery account for 90% of the dramatic increase in this procedure over the past forty years: dystocia, repeat cesarean section, breech presentation, and fetal distress .

Objective: - To determine cesarean section prevalence, indications and management outcome in MKH from Mar.1- Aug.30, 2013.

Methods: - Hospital based retrospective cross-sectional record review was conducted. Data were collected using structured checklist and all the cesarean delivery from Mar. 1 to Aug.30, 2013 were included in the study .Analysis was made using SPSS v. 16.0 and associations was made using binary logistic regression; the result displayed using statistical tables.

Results: - In the retrospective study done in Metu Karl Hospital, there were 1023 total deliveries out of which 186 of them were delivered by cesarean section making the prevalence of 18.2% and 75.8% of the women have ages ranging from 20-29years and 71% were from rural area with 53.8% para one and 83.9% were term with GA of 38-42 weeks with 80.1% having ANC follow up from different health institution. C/S was done on emergency base in 96.2% of women who undergone C/S and 52.2% have weight of ≥ 3.5 kg and 95.5% have normal APGAR score and the four main indications for C/S were CPD(44.1%), non reassuring fetal heart rate pattern(18.3%), malpresentations(14.5%), and repeated cesarean section(12.4 %) contributing for 89.3% of indications and complication seen in 21(11.3%) of women in the study populations; i.e. wound site infection(42.9%), puerperal sepsis(19.0%), hemorrhage(23.8%), death(4.8%) and others(9.5%) and cause of death was anesthesia complication. 8(4.3%) were new born with bad fetal outcome with 6(75%) of them were still birth and 2(25%) were early neonatal death with perinatal mortality rate of 43/1000 live birth.

Conclusion

The cesarean prevalence in this study was 18.2% and the most common indication was cephalo-pelvic disproportion(44.1%) and bad maternal and fetal outcome were 21(11.3%) and 8(4.3%) respectively with perinatal mortality rate of 43/1000 live births.

Acknowledgement

This research paper was developed through strong advice from advisors. Therefore; I am very grateful to my advisors Ato Garumma Tolu and Ato Kalkidan Hussen for their unreserved advice and constructive suggestions and comments on research paper from the time of topic selection up to research paper writing. Especial thank goes to MKH staffs working at different departments for giving me relevant information which are useful in the development of the research paper. Especial thank goes to donors and sponsors which make me continue my learning safely i.e. UNFPA, WHO, MoH, and Gambella regional health bureau. Once again I would like to thank my family for their nice telephone conversation which initiates me to work actively in all the school activities including research paper. Last but not least I would like to thank computer center in Metu town for their cooperative in making me use internet available in the area and using computer safely.

Table of Contents

Abstract.....	i
Acknowledgement	ii
Table of contents.....	iii
List of Abbreviations.....	v
List of tables	vii
Chapter one	1
INTRODUCTION	1
1.1:- Back ground	1
1.2:- statement of the problem	3
1.3:- significance of the study	5
Chapter two	6
Literature review.....	6
2.1 Cesarean Section Rate Globally	6
2.1.1 Prevalence of Cesarean Delivery.....	6
2.1.2 Indications of Cesarean Delivery.....	8
2.1.3 Risk factors and Complications of Cesarean Delivery	10
Conceptual framework	12
Chapter three.....	13
Objectives	13
3.1:- general objective	13
3.2:- specific objectives.....	13
Chapter four.....	14
Methods and materials.....	14
4.1:-Study area and study period.....	14
4.2:- study design.....	14
4.3:- population.....	14
4.3.1:- source population.....	14
4.3.2:- study population.....	15

4.4:- Sampling technique or procedure	15
4.4.1:- sample size determination	15
4.5:- Inclusion and Exclusion criteria	15
4.5.1:- Inclusion criteria	15
4.5.2:- Exclusion Criteria	15
4.6:- Study variables.....	15
4.6.1:- independent variables	15
4.6.2:- dependent variables	15
4.7:- Operational definition	16
4.8:- Data collection process.....	16
4.9:- Data processing and analysis.....	16
4.10:- Dissemination of the findings	16
4.11:- Ethical clearance	17
Chapter five.....	18
Results.....	18
5.1:- Socio-demographic information.....	18
5.2:- Obstetrics history and indications of cesarean delivery.....	19
5.3:- Management outcome of cesarean section.....	22
5.4:- Factors associated with management outcome.....	23
Chapter six	26
Discussion.....	26
Chapter seven	30
Conclusion and recommendation.....	30
7.1:- conclusion	30
7.2:- recommendation	31
References	32
Annexes.....	34
Annex 1:- Checklist.....	35
Annex 2: - (a)prevalence of C/S in comparison with that of MKH.....	38
Open EPI software summery output at 95% Confidence Limits for Proportions.....	38
(b):- CPD as common indication for C/S in comparison with that of MKH	38

List of Abbreviations

- ANC: - Antenatal care.
- AOR:- Adjusted odd ratio.
- APH: - Ante partum hemorrhage.
- BSc: - Bachelor Science.
- CDMR: - Cesarean delivery on maternal request.
- C/D:- Cesarean delivery.
- CI:- Confidence interval
- COR:- Crude odd ratio.
- CPD: - Cephalo-pelvic disproportion.
- C/S: - Cesarean section.
- DHS: - Demographic health survey
- DIC: - Disseminated intravascular coagulation.
- DVT: - Deep venous thrombosis.
- GA: - Gestational age.
- Gyn/obs:-Gynecology and obstetrics.
- Hgb.:- Hemoglobin.
- HIV: - Human immune deficiency virus.
- IEOS: - Integrated emergency obstetrics and gynecology and general surgery.
- LHS:- Length of hospital stay.
- LNMP: - Last normal menstrual period.
- LUSTCS: - Lower uterine segment transverse cesarean section.
- MKH: - Metu Karl Hospital.
- MMR: - Maternal mortality rate.
- MPH: - Master in public health.
- MSc: - Master in Science.
- MSF: - Medicines sans Frontiers
- NGO:-Nongovernmental organization.
- NRFHRP:- Non reassuring fetal heart rate pattern.
- OR: - Operation room.
- PIH: - Pregnancy induced hypertension.

PNMR: - Perinatal mortality rate.

RVF: - Recto vaginal fistula.

TATH: - Tikur Anbessa Teaching Hospital

US:- United states

VVF: - Vesico vaginal fistula.

WHO: - World health organization.

List of tables

Table 5.1 :- table showing socio-demographic information-----	18
Table 5.2 :- table showing obstetric history and C/S indications -----	20
Table 5.3 :- table showing cesarean section related management outcome-----	22
Table 5.4 :- table showing factors associated with management outcome -----	24

Chapter one

INTRODUCTION

1.1:- Back ground

Cesarean section is a term commonly used in obstetrics to describe the delivery of a viable fetus through an incision in the abdominal wall and the uterus. This definition does not include removal of the fetus from the abdominal cavity in the case of rupture of the uterus or in the case of an abdominal pregnancy (1, 2). Cesarean delivery is the most common major operation performed in the United States today. The rate of cesarean deliveries has increased fivefold, from 5% of births in 1970 to nearly 25% of births today. This dramatic increase in the cesarean delivery rate has been attributed to many factors, including assumed benefit for the fetus, relatively low maternal risk, societal preference, and fear of litigation(3).

Cesarean section significantly reduces maternal and perinatal mortality. The WHO considers Cesarean section rates of 5–15% to be the optimal range for targeted provision of this life saving interventions for mother and infant; lower rates suggest unmet need, while higher rates suggest improper selection. However, access to safe Cesarean section in resource-limited settings is much lower, estimated at 1–2% reported in sub-Saharan Africa (7).

According to national review of cesarean delivery in Ethiopia, the national population-based cesarean delivery rate was 0.6%, with regional rates varying from 0.2% to 9%. The overall institutional rate was 18%, which varied between 46% in the private sector for-profit and 15% in the public sector. Maternal indications accounted for 66% of the cesareans reviewed, and fetal indications for 34%. (13)

The prospective hospital-based study was done at Tikur Anbessa Teaching Hospital (TATH) between July 1991 and July 1992 out of 3237 deliveries, 318(10%) were cesarean section. The leading or the major indication for abdominal deliveries were: repeat cesarean section, 103(32.4%), cephalo-pelvic disproportion, 93(29.2%), placenta previa and abruptio-placentae 40(12.6%) (15).

In prospective study, on 100 mothers who have undergone cesarean section in Jimma Hospital from 23rd June 1992 to 24th September 1993 out of 1236 deliveries there were 100 cesarean section making a cesarean birth rate was 8%.

The leading indications for cesarean section were cephalopelvic disproportion (44%), malpresentations and malpositions (21%), repeat cesarean section (16%), antepartum hemorrhage (8%) and fetal distress (6%), accounting for 95% of the indications for cesarean section (16).

Cesarean deliveries are categorized as either primary (i.e. first cesarean delivery) or repeat (i.e. after a previous cesarean birth) Cesarean operations are classified according to the orientation (transverse or vertical) and the site of placement (lower segment or upper segment) of the uterine incision. These are: - Low transverse, low vertical, classic incisions (5).

Four indications for cesarean delivery account for 90% of the dramatic increase in this procedure over the past forty years: dystocia (30%), repeat cesarean section (25% to 30%), breech presentation (10% to 15%), and fetal distress (10% to 15%)(3).

Less common indications are abnormal placentation (e.g.placenta previa, vasa previa, placenta accreta), maternal infection (herpes simplex, HIV), multiple gestation, impending maternal death, unstable ischemic coronary artery diseases, mechanical obstruction to vaginal birth (e.g. large leiomyoma or condyloma acuminata, severely displaced pelvic fracture, macrosomia, fetal anomalies such as severe hydrocephalus), women with invasive cervical cancer, or active perianal inflammatory bowel diseases and those who undergone repair of VVF or RVF(1).Although the rate is difficult to determine with precision, elective cesarean delivery is on the rise and by one estimate, has increased 50 percent in the past decade. In 2.5 percent of all births in the United States in 2003 were defined as cesarean delivery on maternal request (CDMR) (1).

Intra-operative complications following cesarean section includes hemorrhage and injury to adjacent organs. Injury to the bowel, bladder, and ureters is uncommon; however, the obstetrician must be familiar with management of these problems. The key element is to recognize and define the extent of these injuries and to promptly institute repair. Consultation with urologist, general surgeon, or gynecologic oncologist may be necessary depending on the skill level of the obstetrician and the complexity of the injury encountered. (4)

1.2:- statement of the problem

Cesarean delivery is the most common major operation performed in the US today. The rate of C/D has increased fivefold, from 5% of birth in 1970 to nearly 25% of birth today. This dramatic increase in the C/D rate has been attributed to many factors including assumed benefits for the fetus, relatively low maternal risk, societal preference, and fear of litigation (1, 2, 3).

According to the study done on 137 countries from 192 United Nations member states of the world, representing 95% of global births in the year 2008. In 133 countries the available C/S rates were considered national rates. From approximately 18.5 million cesarean sections are performed yearly worldwide about 40% of the countries have C/S rates <10%, about 10% have C/S rates between 10 and 15%, and approximately 50% have C/S rates >15%. 54 countries with C/S rates <10% account for only 25% (4.5 millions) of the global C/S but for 60% (77 millions) of the total number of births worldwide. On the other hand, 73% (13.5 millions) of the total number of C/S are performed in the 69 countries with C/S rates >15% where 37.5% (48.4 millions) of the total number of births occur. (27)

From the report, there was 3.2 million additional C/S would be needed in the 54 countries with C/S rates <10%. The vast majority of these countries are from Africa (68.5%), 29.6% from Asia and 1 country from Latin America and the Caribbean. (27)

In 6 countries (Nigeria, India, Ethiopia, Congo Democratic Republic, Pakistan and Indonesia) account for 50% of the total number of additional C/S needed. Using 5% as the threshold rate to define the underuse of C/S, nearly 1 million C/S would be additionally needed in 33 countries. (27)

WHO has proposed that countries are said to have optimal cesarean section if its C/S rate ranges from 5-15 percent of births. On the whole, cesarean delivery is extremely low with a coverage rate as low as 1.8% according to the 2011 DHS. In seven out of the 11 regions the rate of cesarean section was below 2%. Rates were in the range of 8-10% in Gambella, Harai and Dire Dawa. The highest rate of cesarean section delivery was reported in Addis Ababa at 20% according to the 2011 DHS. There was also a significant increasing trend in the rate of cesarian delivery in Addis Ababa (9% to 20%), in Dire Dawa (3% to 8.5%), Harari (4.1% to 8.6%), Gambella (3% to 9.7%) and Tigray (0.6% to 3.4%) from 2000 to 2011. Generally the C/S rate ranges from 0.1 to 20.1 across country that varies among 11 regions of Ethiopia. (28)

According to national review of cesarean delivery in 751 health facilities of Ethiopia providing delivery service (July 2007–June 2008), the national population-based cesarean delivery rate was 0.6%, with regional rates varying from 0.2% to 9%. The overall institutional rate was 18%, which varied between 46% in the private sector for-profit and 15% in the public sector. Maternal indications accounted for 66% of the cesareans reviewed, and fetal indications for 34%. Three-quarters of the cesareans were recorded as emergencies, but only 12% of these had their labor monitored with a partograph, 12% of the cases reported wound infection. There were 2% maternal deaths and 14% of the newborns were stillbirths or died shortly after birth. (13)

The C/S rate increased significantly from 2.3% in 1995/1996 to 24.4% in 2009/2010. The rates among women with secondary (32.3%) or higher levels of education (33.3%) were nearly two times higher than the corresponding figures in the illiterates (14.8%) and women with primary education (15.8%). The level among women from the rich households (28.6%) was higher than those from the poor (16.4%) and middle (19.5%) households. The rate also significantly increased with rising parity. The rate among women who delivered in private health institutions (41.7%) was twice higher than those who delivered in public institutions (20.6%). (29)

A prospective study done on 100 mothers who have undergone cesarean section in Jimma Hospital from 23rd June 1992 to 24th September 1993 were analyzed out of 1236 to determine the incidence, indications and post operative complications of caesarean delivery; giving a cesarean birth rate of 8%, the leading indications were cephalopelvic disproportion (44%), malpresentations and malpositions (21%), repeat cesarean section (16%), ante partum hemorrhage (8%) and fetal distress (6%), accounting for 95% of the indications for cesarean section. The overall morbidity rate was 20% which are due to wound infection (27.1%), sepsis (21.4%), endometritis (33.3%), hemorrhage(8%) and wound dehiscence (10%). The gross perinatal mortality rate of 120 per 1000 live births was not significantly higher than the rate for all deliveries, which was 92.5% per 1000 live births. The single most important cause of perinatal death was prolonged and obstructed labor. In order to reduce the high perinatal mortality and maternal morbidity, there is a strong and urgent need to prevent prolonged and obstructed labor through effective antenatal care and referral system. (16)

1.3:- significance of the study

Cesarean section is one of the most commonly worldwide performed surgical procedures in the obstetrics emergency. It is done based on common indications. Even though cesarean delivery is done frequently in different part of Ethiopia, there are no research done in most part of Ethiopia including Metu Karl Hospital; a Zonal Hospital which is found in Illu Ababora Zone; southern west part of Ethiopia.

Therefore; at the end of the research, the result of the study will acts as a source of information for the administrative body and country at large including NGOs to allocate the resource based on the plans. It can also be a base for staffs to know the common indications for C/D, management outcome and complications. Therefore; this study will be input for the hospital administrative bodies and other concerned bodies.

Chapter two

Literature review

2.1 Cesarean Section Rate Globally

Cesarean section rates show a wide variation among countries in the world, ranging from 0.4 to 40 percent, and a continuous rise in the trend has been observed in the past 30 years. Approximately 18.5 million cesarean sections are performed yearly worldwide. Recent current estimates of cesarean birth rates indicate an overall cesarean rate of 12.4% in the developing world. Sub-Saharan Africa remains the only region in the developing world not to have reached the minimum 5% cesarean rate suggested by WHO (11, 12).

The most common indications for C/D in developed and developing countries include: failure to progress during labor, previous C/S and other uterine surgery, non reassuring fetal status, malpresentation, APH, pregnancy induced hypertension and multiple gestations (9,14). C/S has risks for the mother and the neonate. Risks of certain peripartum complications have long been associated with cesarean delivery, such as post-operative infection, anesthesia complications, hemorrhage and embolism. Premature birth, breathing problems and low APGAR score are some of the neonatal risks (17).

2.1.1 Prevalence of Cesarean Delivery

The cesarean delivery rate has increased throughout the world, but rates in certain parts of the world are still substantially lower than in the United States.

The cesarean delivery rate is approximately 21.1% for the most developed regions of the globe, 14.3% for the less developed regions, and 2% for the least developed regions. In a 2006 publication reviewing cesarean delivery rates in South America, the median rate was 33% with rates fluctuating between 28% and 75% depending on public service versus a private provider (10).

The cesarean rate rose by 53% from 1996 to 2007, reaching 32%, the highest rate ever reported in the United States. From 1996 to 2007, the cesarean rate increased for mothers in all age and racial and Hispanic origin groups. The pace of the increase accelerated from 2000 to 2007. In 2007, approximately 1.4 million women had a cesarean birth, representing 32% of all births, the

highest rate ever recorded in the United States and higher than rates in most other industrialized countries. Rates of cesarean delivery typically rise with increasing maternal age.

As in 1996 and 2000, the rate for mothers aged 40–54 years in 2007 was more than twice the rate for mothers under age 20 (48% and 23%, respectively) (19).

Recent current estimates of cesarean birth rates indicate an overall cesarean rate of 12.4% in the developing world. Sub-Saharan Africa remains the only region in the developing world not to have reached the minimum cesarean rate of 5% suggested by WHO (12).

Review of the cesarean sections performed at Sultan Qaboos University Hospital (SQUH), Muscat, Oman, over a period of three years shows the following findings. The C/S rate during this period was 13%, 42.6% of which were repeat C/S. Most were performed on women in the age group 26–30 years and of parity 2–3. The majority of the cesareans were at term and done under general anesthesia (20).

A retrospective study from 2000-2005 conducted in Nigeria (at Maiduguri Teaching Hospital) showed also that out of 10,097 deliveries, 1192(11.8%) were cesarean deliveries. The cesarean section rate showed a steady increase over the years (7.2% in 2000 – 13.95% in 2005) (7).

Another retrospective study performed on the trends of cesarean delivery over a 10– year period at Ilorin, Nigeria showed, out of 30,267 deliveries 2764 were cesarean births giving an overall C/S rate of 9.1%. Cesarean birth rose from 1 in 26 deliveries in 1990 to 1 in 5 deliveries by 1999 (21).

A retrospective analysis of cesarean section performed in Jos University Teaching Hospital between January 1994 and December 1998. There were 11,571 deliveries of which 2083 were cesarean sections giving an incidence of 18%. 62.2% of the patients who had cesarean section were booked for antenatal care and delivered in the hospital, while 37.8% were unbooked seen as emergency. 90% of the operations were done as an emergency while only 10% was electively performed. There was a high cesarean section rate in all the age groups as well as the various parity distributions (6).

A study was conducted on the pattern of obstetrical and gynecological admissions in Ribat University Hospital, Khartoum from January to December 2003. From 9092 deliveries that occurred during the study period, normal spontaneous vaginal delivery represents (61.1%), elective C/S were 16.2% and emergency C/S were 14.7% (22).

According to national review of cesarean delivery in Ethiopia, The national population-based cesarean delivery rate was 0.6%, with regional rates varying from 0.2% to 9%. The overall institutional rate was 18%, which varied between 46% in the private sector for-profit and 15% in the public sector.(13)

A prospective study conducted in Tikur Anbessa Hospital showed that out of a total of 3237 deliveries, 318(10%) were cesarean sections. Age ranged from 15-40years, 58(18.2%) were women under the age of 20, and 182(57%) were between 20 and 30years age which is the safest period to bear children. Eighty one (25%) of the mothers were primipara, 158(50%) were between para one and para four, 79(25%) were grand multiparae. Seventy six (24%) of the cases were not registered for ANC care in any health institution. Two hundred and fifteen (67.6%) of the mothers had primary C/S. Fifty seven (18 %) had elective C/S and 261(82%) were emergency C/S (15).A comparative study in Tikur Anbessa hospital by Ayalew (unpublished data from the department of Obstetrics and Gynecology of the study hospital) has shown that the cesarean section rate increased from 7.7% in 1986/1987 to 25.6% in1998/1999 (17).

Another prospective study from June 1992- 24th 1993 conducted on analysis of cesarean delivery in Jimma Hospital showed that, out of 1236 deliveries, 100 mothers were delivered by cesarean delivery giving a cesarean birth rate of 8% (16).

2.1.2 Indications of Cesarean Delivery

Currently, in the developed world, approximately 30% of cesarean sections were repeat cesarean sections after primary cesarean section, 30% are performed for dystocia, 11% are performed for breech presentation and 10% are performed for fetal distress. In some South American countries C/D rates are said to be as high as 80%.The phenomenon of cesarean sections performed for maternal choice alone, in the absence of any obstetrics, medical or fetal indication, merely highlights the fact that the indications for cesarean section have become increasingly relaxed and are nearly all relative (with some obvious exceptions)(23).

Review of the cesarean sections performed at Sultan Qaboos University Hospital (SQUH), Muscat, Oman, over a period of three years shows that the most common indication for primary C/S was fetal distress 134(32.1%) followed by breech presentation 78(18.7%); for repeat C/D, two or more previous C/S 137(44.2%) followed by fetal distress 29(9.4) were the most common indication (20).

A retrospective study from 2000-2005 conducted in Nigeria (at Maiduguri Teaching Hospital) showed that the major maternal indications were, CPD(15.5%), previous C/D (14.7%), eclampsia (7.2%), failed induction (5.5%) & placenta previa(5.1%). Fetal distress (9.6%), breech presentation (4.7%), fetal macrosomia (4.3%), & pregnancy complicated by multiple fetuses (4.2%) were the major fetal indications (8). Another retrospective study performed on the trends of C/D over a 10– year period at Ilorin, Nigeria showed CPD, 851(30.8%) remained the commonest indication for C/S throughout the study period. The other indications were APH 363(13.1%), failed induction 296(10.7%), pre-eclampsia/eclampsia, 258(9.3%) and fetal distress 237(8.6%) (21).

A retrospective analysis of C/D performed in Jos University Teaching Hospital between January 1994 and December 1998 show that the main indications for C/S were the elective section for repeat C/D, placenta praevia, precious baby, severe PIH and bad obstetric history while those for emergency C/D were CPD, fetal distress, repeat C/S, APH, severe PIH, obstructed labor and breech presentation (8).

A study was conducted on the pattern of obstetrical and gynecological admissions in Ribat University Hospital, Khartoum from January to December 2003. With regards to indications of emergency C/S, it was due to contracted pelvis (13.3%) in labor, failure of progress (12%), while severe PIH constituted (11%), more than one previous scar (10.7%), fetal distress (10.4%), and breech presentation (5.5%). On the other hand, the main indications of elective C/S were contracted pelvis (35.5%) followed by multiple scars (24.9%) (21).

A prospective study conducted in Tikur Anbessa Hospital showed that the leading indication for abdominal deliveries were repeat cesarean section 103(32.4%), CPD 93(29.2%), placenta previa and abruptio placenta 40(12.6) (14).

A comparative study in Tikur Anbessa hospital by Ayalew(unpublished data from the department of Obstetrics and Gynecology of the study hospital) has shown that a change in common indication from previous cesarean section (29.7%) in 1986/1987 to fetal distress (26.6%) in 1998/1999 (17).

Another prospective study from June 1992- 24th 1993 conducted on analysis of cesarean delivery in Jimma Hospital showed that the leading indications for cesarean birth were,

CPD(44%),malpresentation & malpositions (21%), repeat cesarean section (16%),APH (8%) and fetal distress (6%) accounting for 95% of the indications for cesarean section (16).

2.1.3 Risk factors and Complications of Cesarean Delivery

Cesarean delivery involves major abdominal surgery, and is associated with higher rates of surgical complications and maternal re-hospitalization, as well as with complications requiring neonatal intensive care unit admission. In addition to health and safety risks for mothers and newborns, hospital charges for a cesarean delivery are almost double those for a vaginal delivery, imposing significant costs (19).

Researchers in Seattle, US, checked re-admissions to hospital within 60 days of birth to their first child for over 200,000 women. Cesarean mothers had a significantly increased risk (almost twice as high) of being readmitted to hospital compared with those who had a vaginal delivery.

There were increased risks for uterine infection; wound complications, cardiopulmonary problems and thromboses. Unexpected increases were also found in gall bladder disease and appendicitis, which had not previously been reported as risks of cesarean although gall bladder problems are known to happen after other abdominal surgery. The authors suggest that appendicitis might be increased because the abdomen is disturbed and an existing subclinical infection could be exacerbated. 17 per 1000 of cesarean mothers were re-hospitalized. While only 1.2% of women needed readmission, there was 80% increase in hospitalization for those who had been sectioned, and a 30% increase after assisted deliveries (23).

The study done in US compared primary cesarean section with vaginal delivery for singleton full-term women with no indicated medical risks or complications and found that the risks for babies delivered by cesarean section were three times higher than those delivered vaginally(1.77 per 1,000 live births compared with 0.62 per 1,000 live births)(25).

A retrospective study of intra-operative and post-operative maternal complications of C/S during a 10- year period in Europe indicates the overall maternal intra-operative complication rate was 14.8%. The most common complications were laceration of the uterus corpus (10.1%) and blood loss greater than 1000ml (7.3%). The overall maternal post operative morbidity rate of 35.7%; fever (24.6%), blood loss between 1000ml and 1500ml (4%), hematoma (3.5%) and UTI (3%) were the most frequent complications. The primary elective group showed significantly lower major (2.6%) minor (23.7%) complication rates compared to the emergency groups (major 5.2%,

minor 34%). Inclusion emergency C/S carried the greatest risks regarding maternal complication compared to elective procedures (26).

Review of the cesarean sections performed at Sultan Qaboos University Hospital (SQUH), Muscat, Oman, over a period of three years shows the most common complications of C/S were fever, 182(25.0%), blood transfusion, 62(8.5%) wound infection 20(2.8%) and urinary tract infection, 11(1.5%) (20).

Another retrospective study performed on the trends of cesarean delivery over a 10– year period at Ilorin, Nigeria showed the common causes of C/S related MMR were sepsis, 9(31.0%), hemorrhage, 8(27.6%), anesthesia, 8(13.8%) and embolism 4(13.6%). There were 29 and 12 maternal deaths following C/S and vaginal delivery respectively. All cesarean mortality cases recorded were under emergency situations. Maternal mortality ratio relating to C/S (1,050/100,000) was higher than that for vaginal delivery (40/1000) (21).

A retrospective analysis of cesarean section performed in Jos University Teaching Hospital between January 1994 and December 1998 the maternal mortality rate was found to be 624.1/100,000 due mainly to hemorrhaged, eclampsia and sepsis and there was one anesthetic death amongst the booked patients. The perinatal mortality rate was 81.6/1000. The clinical causes of deaths were birth asphyxia, ante-partum hemorrhage, obstructed labor and prematurity.(8)

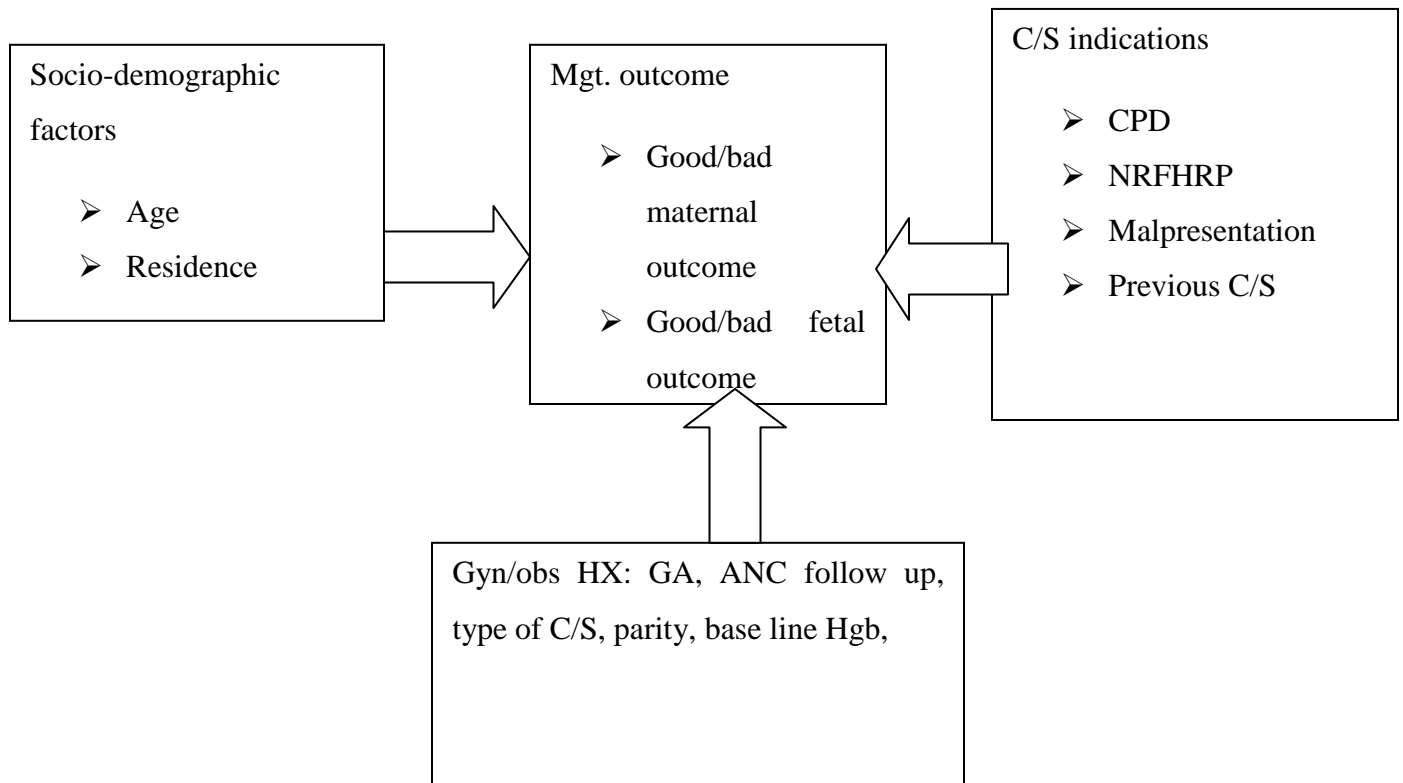
A prospective study conducted in Tikur Anbessa Hospital showed that on eight (2.5%) of the patient obstetric hysterectomy were performed. There were five maternal deaths among C/S cases. The main cause of maternal death was failure to control bleeding during the C/S. There were 9(2.8%) still births and 15(4.7%) early neonatal deaths. The mean birth weight among booked C/S was 3108grams and unbooked CS was 2991grams. The major obstetric complications in the cases were APH, 34(11%) and pregnancy induced hypertension disorder (PIH) 32(10%). Sixty one (19%) had blood transfusion (15).

Another prospective study from June 1992- 24th 1993 conducted on analysis of cesarean delivery in Jimma Hospital showed that there was no maternal death, but the overall maternal morbidity rate was 20%. The causes of morbidity were wound infection (27.1%), sepsis (21.4%), and endometritis (33.3), hemorrhage (8%) & wound dehiscence (10%). The gross perinatal mortality rate (PNMR) of 120/1000 live births was not statistically higher than the rate for all deliveries,

which was 92.5%/1000 live births. The single most important cause of perinatal death was prolonged and obstructed labor (16).

According to the study done in Jimma hospital from 1990-1999, there were 13,425 deliveries at Jimma Hospital and 1664 perinatal deaths of which 1482 were still births and 182 early neonatal deaths making the overall perinatal mortality rate 1664/11983 (138.9 per thousand live births). The lowest perinatal mortality of 75.7 per thousand live births occurred during 1991 and the highest 213.3 per thousand occurred in 1995, whereas the overall trend was increasing during the study period.(30)

Conceptual framework



Chapter three

Objectives

3.1:- general objective

- ❖ To determine cesarean section prevalence, indications and management outcome in Metu Karl Hospital.

3.2:- specific objectives

- ❖ To describe prevalence of cesarean section in Metu Karl Hospital from Mar.2013-Aug 2013.
- ❖ To determine common indications of cesarean section in Metu Karl Hospital from Mar.2013-Aug 2013
- ❖ To describe management outcome following cesarean section in Metu Karl Hospital from Mar.2013-Aug 2013

Chapter four

Methods and materials

4.1:-Study area and study period

All cesarean deliveries in Metu Karl Hospital from Mar. 1-Aug 30, 2013 was included in the study. Metu is one of the Zones of Oromiya region situated in the southern west part of Ethiopia at 595 km away from Addis Ababa the capital city of Ethiopia with the catchment population of 1.5 million of which 352800 are women in reproductive age group with estimated delivery of 10584 annually. On top of the above mentioned catchment population it additionally give medical service to population of Gambella and Masha; those who came with referral paper since it acts as referral hospital for the above mentioned population. It was established by Swedish missionaries in the year 1932. The staffs in Metu Karl Hospital are: 1 surgeon,1 gynecologist, 1 dental surgeon,1 ophthalmologist, 2 IEOS, 11 general practitioners, 8 health officers, 4 anesthetists, 88 nurses, 8 laboratory technologists, 5 pharmacists; making a total of 130 medical staffs. The departments in the hospital are surgery, obstetrics & gynecology, medical and pediatrics department. Hospital has a total of 160 beds of which 28 of them are found in obstetrics & gynecology ward. It has 2 delivery coaches, 4 beds for first stage, 3 beds for non complicated postnatal cases, 12 beds for post-operative patients and the remaining 7 beds are for all other gynecological cases. Activities in Obs/Gyn ward are performed by 1 gynecologist, 1 IEOS, 4 midwives nurses and 8 clinical nurses. Some of the services which are given by these departments are abortion care, safe delivery service, OR service, cesarean section, and other emergency minor and major surgical operations, blood transfusion, elective minor and major gynecological operations ophthalmological operations, dental operations.

4.2:- study design

A hospital based retrospective cross-sectional charts review was performed to collect the data.

4.3:- population

4.3.1:- source population

All deliveries in Metu Karl Hospital from Mar.1-Aug. 30 2013.

4.3.2:- study population

All cesarean deliveries in Metu Karl Hospital from Mar.1-Aug. 30 2013.

4.4:- Sampling technique or procedure

4.4.1:- sample size determination

A hospital based retrospective charts review were performed to collect the data from Metu Karl Hospital and all cesarean delivery was included in the study(186).

4.5:- Inclusion and Exclusion criteria

4.5.1:- Inclusion criteria

- All cesarean delivery with relevant information was included in the study.

4.5.2:- Exclusion Criteria

- All cesarean delivery with no relevant information was excluded from the study.

4.6:- Study variables

4.6.1:- independent variables

- Socio-demographic characteristics:
 - ✓ Age
 - ✓ Residence (urban or Rural),
- Gyn/obs history of women: parity, still birth, type of C/S.
- ANC follow up.
- Gestational age in weeks.
- Pre-operative Hgb.
- Fetal weight

4.6.2:- dependent variables

- Management outcome
 - ❖ maternal outcome
 - ❖ fetal outcome

4.7:- Operational definition

- ❖ Cesarean section: - is delivery of viable fetus through incision made on abdominal wall (laparotomy) and uterus (hysterotomy).
- ❖ Emergency C/S: - C/S done after the onset of labour and occurrence of complications.
- ❖ Elective C/S: - C/S done before the occurrence of complication and before the onset of labour.
- ❖ Primary C/S: - C/S done for the first time.
- ❖ Repeat C/S: - C/S done for the second time or more.
- ❖ Malpresentation: - Any fetal presentation out of vertex.
- ❖ Good maternal outcome:- Mother without complications following C/S
- ❖ Bad maternal outcome:- Mother with complications following C/S
- ❖ Good fetal outcome :- Fetus without complications following C/S
- ❖ Bad fetal outcome :- Fetus with complications following C/S
- ❖ Early neonatal death: - Death of new born in the first week of neonatal life.
- ❖ PNMR:- total number of still birth and early neonatal death per 1000 live births.
- ❖ Urban: - Residential area inside metu town.
- ❖ Rural:- Residential area outside metu town.

4.8:- Data collection process

Data were collected from OR and Gyn/obs registration books. Before data collection, cards number were listed from this two department then using structured check list patient chart was revised after cards were collected from card room to make information complete.

4.9:- Data processing and analysis

Collected data were coded and entered the SPSS v-16.0 then analysis made using SPSS v-16.0 and using binary logistic regression association was made and the of the results of study were displayed using statistical tables.

4.10:- Dissemination of the findings

The finding of the study will be disseminated to Jimma University College of public health and medical science and department of integrated emergency obstetrics and gynecology and general surgery, Metu Karl Hospital, and NGO who are interested in the area of study. Furthermore attempt will be made to publish the result of this study on journals.

4.11:- Ethical clearance

Permission letter was obtained from Jimma University ethical clearance board and submitted to Metu Karl Hospital administrative office then to specific department where data was collected.

Chapter five

Results

5.1:- Socio-demographic information

In the retrospective study done in MKH from Mar.1, 2013 to Aug.30, 2013, 186 mothers who have undergone cesarean section were analyzed to determine cesarean section prevalence, indications and management outcome. In this study, there were 1023 total deliveries of which 186 of them delivered by cesarean section making the prevalence of 18.2%.

Ages groups range from 15-47 & majority of them were within the range of 20-29 years making 75.8%, followed by ≥ 30 (14%) and < 20 (10.2%) respectively. mean age groups were 23.97 (SD \pm 4.751). 71% of the patients were from rural area and the remaining 29% were from urban.

Table 5.1:- Table showing socio-demographic information in women who have undergone C/S in MKH June, 2014

Variables	No	%
Age groups		
<20	19	10.2
20-29	141	75.8
≥ 30	26	14.0
Residence		
Rural	132	71
Urban	54	29

5.2:- Obstetrics history and indications of cesarean delivery

When we see parity in the course of this study, 100(53.8%) of the women who undergone cesarean section were para one followed by para 2-4 and para 5& above, making 75(40.3%) and 11(5.9%) respectively, and the range of gestational age were from 32-44 with the majority of the women, 156(83.9%) were with the gestational age of 38-42 weeks and 19(10.2%) of them were ≥ 42 weeks and 11(5.9%) were < 38 weeks with mean of 38.89 and $SD \pm 1.730$ and 80.1% have ANC follow up from different health institution. The duration of labor was 12-24 hours making 83(43.6%) followed by < 12 and ≥ 24 hours 62(33.3%) and 41(22%). (mean 16.06, $SD \pm 12.88$.)

In 179(96.2%) of the study, C/S was done on emergency base with 99.5% having LUSTCS and pre-operative hemoglobin was ≥ 12 gm/dl 153(82.3%), 10-12(14%) and < 10 gm/dl (3.8%) and post-operative hemoglobin was 10-12 gm/dl 82(44.1%) followed by ≥ 12 and < 10 making 67(36%) and 37(19.9%). (mean 12.51, $SD \pm 1.38$ and mean 10.64, $SD \pm 1.81$ respectively) .

The length of stay in the hospital < 7 days was 146(78.5%) and ≥ 7 days of 40(21.5%) with mean of 5.67 and $SD \pm 3.89$.

Neonatal weight in this study ranges from 1.4kg to 4.9 kg with majority of weight were ≥ 3.5 kg 97(52.2%) followed by 2.5-3.5 kg 76(40.8%) and > 2.5 kg 13(7%). Mean of weight was 3.33 and $SD \pm 0.547$. Out of 178 new born with good fetal outcome, 170(95.5%) have APGAR score of ≥ 7 which is normal APGAR score and the remaining 8(4.5%) of them have the APGAR score < 7 with mean of 7.94 and $SD \pm 1.916$.

When we see the common indications of cesarean sections; the four common indications for C/S were CPD(44.1%), non reassuring fetal heart rate pattern(18.3%), malpresentations(14.5), and repeated cesarean section(12.4 %). This contribute for 89.3% of cesarean indications and the remaining less common C/S indications were APH(8.0%) and obstructed labor(2.7%).

Table 5.2:- Table showing obstetrics history and C/S indications in women who have undergone C/S in MKH June, 2014

Variables	Numbers	%
Parity		
1	100	53.8
1-4	75	40.3
5 and above	11	5.9
GA in weeks		
<38	11	5.9
38-42	156	83.9
>=42	19	10.2
ANC follow up		
Yes	149	80.1
No	37	19.9
C/S type		
Emergency	179	96.2
Elective	7	3.8
Type of uterine incision		
LUSTCS	185	99.5
Classical	1	0.5
Length of stay in the hospital		
<7	146	78.5
>=7	40	21.5
Neonatal weight in kg		
<2.5	13	7
2.5-3.5	76	40.8
>=3.5	97	52.2
APGAR score in 5 th		

minutes		
<7	8	4.5
>=7	170	95.5
Indications for C/S		
CPD	82	44.1
NRFHRP	34	18.3
Malpresentation	27	14.5
Previous C/S	23	12.4
APH	15	8.0
Obstructed labor	5	2.7

5.3:- Management outcome of cesarean section

Out of 186 women who have undergone cesarean sections, 165(88.7%) of them have good maternal outcome and 21(11.3%) of the study populations have bad maternal outcome. Complications were wound site infection9(42.9%), puerperal sepsis 4(19.0%), hemorrhage 5(23.8%), death 1(4.8%) and others 2(9.5%); cause of death was anesthesia complication.

Fetal outcome in this study was 178(95.7%) of the study having good fetal outcome and the remaining 8(4.3%) were new born with bad fetal outcome. Out of 8 new born with bad fetal outcome 6(75%) were still birth and 2(25%) were early neonatal death with PNMR of 43/1000 live births. perinatal cause of death in this study was obstructed labor(12.5%), birth asphyxia(62.5%), prematurity(12.5%) and cord accidents(12.5%).

Table 5.3:-Table showing management outcome in women who have undergone C/S in MKH June 2014

Variables	Number	%
Good maternal outcome	165	88.7
Bad maternal outcome	21	11.3
Good fetal outcome	178	95.7
Bad fetal outcome	8	4.3
Maternal complications		
Wound infection	9	42.9
Puerperal sepsis	4	19
Hemorrhage	5	23.8
Death	1	4.8
Others	2	9.5
Fetal complications		
Still birth	6	75
Early neonatal death	2	25

5.4:- Factors associated with management outcome.

Table 5.4 below shows the factors that are associated with management outcome using binary logistic regression for maternal and fetal outcome. Using binary logistic regression the following variables were statistically significant with maternal and fetal management outcome.

These are; ANC follow up (P-value 0.030, COR 0.347 at 95% CI) , Hgb before operation (P-value 0.014, COR 7.446 at 95% CI), Hgb after operation (P-value 0.001, COR 9.026 at 95% CI), and length of stay in the hospital (P-value <0.001, COR 0.053 at 95% CI) were statistically significant with bad maternal outcome. C/S indications (P-value 0.003, COR 0.019 at 95% CI), length of stay in the hospital (P-value 0.002, COR 12.706 at 95% CI) and neonatal weight (P-value 0.040 COR 8.636 at 95% CI) were statistically significant with bad fetal outcome.

When using Multivariate analysis only length of stay in the hospital (P-value <0.001, AOR, 43.012 at 95% CI) was statistically significant with bad maternal outcome. This is to mean that odds for length of stay in the hospital for more than 7 days is 43.012 times higher to cause bad maternal outcome when compare with length of stay in the hospital for less than 7 days. Only C/S indications (P-value 0.017, AOR 0.019 at 95% CI) and length of stay in the hospital (P-value 0.047 AOR 0.156 at 95% CI) were statistically significant with bad fetal outcome. This means that odds for obstructed labor as indication for C/S is 0.019 times higher to cause bad fetal outcome when compare with the rest of the cesarean indications and odds for length of stay in the hospital for more than 7 days is 0.156 times higher to cause bad fetal outcome when compare with length of stay in the hospital for less than 7 days.

Table 5.4: - table showing factors associated with management outcome of C/S in MKH June, 2014

Variables		Management outcome					
		Good maternal outcome	Bad maternal outcome	P-value	COR	P-value	AOR
ANC follow up	Yes	136(91.3%)	13(8.7%)	0.032*	0.347	0.091	4.144
	No	29(78.4%)	8(21.6%)				
Hgb before operation	<10	4(57.1%)	3(42.9%)	0.040®	7.446	0.773	0.683
	10-12	22(84.6%)	4(15.4%)	0.014*			
	>=12	139(90.8%)	14(9.2%)	0.334			
Hgb after operation	<10	26(70.3%)	11(29.7%)	0.005®	9.026	0.062	5.657
	10-12	75(91.5%)	7(8.5%)	0.001**			
	>=12	64(95.5%)	3(4.5%)	0.333			
LHS	<7	141(96.6%)	5(3.4%)	0.000**	0.053	0.000**	43.012
	>=7	24(60%)	16(40%)				
		Good fetal outcome	Bad fetal outcome	p-value	COR	P-value	AOR
C/S indications	CPD	81(98.8%)	1(1.2%)	0.068®	0.019	0.263®	0.019
	OL	3(60%)	2(40%)	0.003**		0.017*	
	NRFHR P	33(97.1%)	1(2.9%)	0.530		0.697	
	Previous C/S	21(91.3%)	2(8.7%)	0.102		0.439	
	malpresentation	23(95.8%)	1(4.2%)	.0427		0.740	
	APH	5(83.3%)	1(16.7%)	0.224		0.394	
LHS	<7	144(98.6%)	2(1.4%)	0.002**	12.706	0.047*	0.156
	>=7	34(85%)	6(15%)				

Neonatal	<2.5	11(84.6%)	2(15.4%)	0.121®	8.636	0.101	9.929
wt in kg	2.5-3.5	72(94.7%)	4(5.3%)	0.040*			
	>=3.5	95(97.9%)	2(2.1%)	0.270			

() significant at P- value <0.01 and (*) significant at P- value <0.05**

(®) = Reference

Chapter six

Discussion

According to the study done in MKH, caesarean prevalence was 18.2% which is more than WHO C/S prevalence which ranges from 5-15%. WHO has proposed that countries are said to have optimal cesarean section if their C/S rate ranges from 5-15%.

Cesarean section rate in Metu Karl Hospital was 18.2% which is consistent with study done in Nigeria Jos University Teaching Hospital between January 1994 and December 1998 with cesarean sections incidence of 18 %.(6)

This is also comparable with the national review of cesarean delivery in Ethiopia, with the overall institutional cesarean delivery rate of 267/1483(18 %)(13). Since the confidence intervals in Nigeria Jos university teaching hospital prevalence & national review of C/D in Ethiopia and ours are over-lapping, there is no statistical difference in cesarean section prevalence.

But the result is not consistent with the a prospective study conducted in Tikur Anbessa Teaching Hospital showing that out of 3237 deliveries, 318(10%) were cesarean sections(15) and prospective study from June 1992- 24th 1993 conducted on analysis of cesarean delivery in Jimma Hospital showing that, out of 1236 deliveries, 100 mothers were cesarean delivery giving a cesarean birth rate of 8% (16). This is probably because Metu Karl Hospital is the only Hospital in the respective area of the study receiving a number of patients from referring units and most of them arrived at the Hospital after they had already developed CPD and obstructed labor which need emergency C/S as we can see higher number of CPD(44.1%) in this study. ([Annex 2:-\(a\) for Open EPI.docx.](#))

In this study age groups ranges from 15-47 years with the majority; 75.8% of the women who have undergone cesarean section in Metu Karl Hospital have age groups of 20-29 years and the remaining 14% and 10.2% were those with age group of ≥ 30 and < 20 years respectively.

This result is higher when compared with a prospective study conducted in Tikur Anbessa Hospital showing that age ranged from 15-40years, 58(18.2%) were women under the age of 20, and 182(57%) were between 20 and 30years age which is the safest period to bear children(17). This is probably because most of the women who delivered by C/S were from rural area who are

at risk of developing CPD or obstructed because of their contracted pelvis following nutritional deficiency.

Most of the women in this study were women with para one making 53.8%, and para 2-4 making 40.3% and the remaining 5.9% were grand multipara.

This result is comparable with the result of the study done in Tikur Anbessa Hospital with the result of 80 (25%) of the mothers were primipara, 158(50%) were between para one and para four, 79(25%) were grand multipara. (15)

Gestational age for women who have undergone cesarean section in the study period ranges from 32-44 weeks. Most of the women who had cesarean delivery, 89.8% were term pregnancy which is 38-42weeks gestational age and average GA was 38.89 and (SD±1.730.), 7% were preterm and the remaining 3.2% were post term pregnancy. This is safe gestational age which can decrease complications like obstructed labor related maternal complications and birth asphyxia following cesarean delivery

80.1% of the study population was book for ANC at different health institutions and only 19.9% did not have ANC follow elsewhere.

This result is higher when compared with a prospective study conducted in Tikur Anbessa Hospital on 318 women who have undergone C/S showing that 242(76%) of them were book for ANC at different health institutions where as 76 (24%) of the cases were not registered for ANC care in any health institution.(15)

This is also higher when compared with the result of the study done in Nigeria Jos University Teaching Hospital between January 1994 and December 1998 on 2083 showing that 62.2% of the patients who had cesarean section were booked for antenatal care and delivered in the hospital, while 37.8% were unbooked seen as emergency.(6)

The possible explanation may be because of retrospective nature of the study with small sample size and short time period.

According to the study done in MKH in 179(96.2%) of the study C/S was done on emergency base while only in 7(3.8%) cesarean section on elective base.

This is higher than the result of the study in Nigeria Jos University Teaching Hospital between January 1994 and December 1998 showing that 90% of the operations were done as an emergency while only 10% was electively performed (6).

It is also higher than the result of the prospective study conducted in Tikur Anbessa Hospital with seven (18 %) had elective CS and 261(82%) were emergency CS (15). This is probably because 71% of women who undergone C/S were from rural area and they arrived at the Hospital after they develop CPD or obstructed labor which need emergency cesarean section. The length of the hospital stay was <7 days making 146(78.5%) and >=7 days of 40(21.5%). Mean 5.67and SD±3.894. Majority of weight were >=3.5kg 97(52.2%). 95.5% of new born in this study have normal APGAR score and average APGAR score was 7.94 and SD±1.196.

The most common indication of C/S contributing for 89.3% of the indications were the four most common indication which are CPD (44.1), NRFHRP (18.3), malpresentation (14.5) and repeat cesarean section (12.4).

The result is consistent with the result of the prospective study from June 1992- 24th 1993 conducted in Jimma Hospital showing that the leading indications for cesarean birth were, CPD(44%),malpresentation & malpositions (21%), repeat cesarean section (16%),APH (8%) and fetal distress (6%) accounting for 95% of the indications for cesarean section (16).

The confidence intervals for CPD as C/S indication in Jimma Hospital over-lap with CPD in Metu Karl Hospital. Therefore; there is no statistical difference for CPD as C/S indications in this study.

But the result is not consistent with the study done in Tikur Anbessa Hospital with the leading indication for abdominal deliveries were repeat cesarean section 103(32.4%),CPD 93(29.2%), placenta previa and abruptio placenta 40(12.6) (16). There is no over-lapping for CPD as cause for cesarean section in Metu Karl Hospital when compared with the result of the study conducted in Addis Abeba Tikur Anbessa Hospital. This shows that there is statistical difference between the result of Metu Karl Hospital with that of Addis Abeba Tikur Anbessa Hospital (15). The possible explanation could be residential difference i.e. Addis Abeba is found in the center with most of the women having best ANC follow up with investigation modalities which can save them from developing CPD and malpresentation might be intervene even before onset of labor. (15).(see annex 2 (b).)

Out of 186 women who have undergone cesarean sections, 165(88.7%) of them have good maternal outcome and 21(11.3%) of the study populations have bad maternal out come and these are 9(42.8%) have wound site infection, 4(19.0%) have puerperal sepsis, 5(23.8%) have hemorrhage, 1(4.7%) death and 2(9.5%) others. Fetal outcome, 178(95.7%) of the study have good fetal outcome and the remaining 8(4.3%) were new born with bad fetal outcome. Out of 8 new born with bad fetal outcome 6(75%) were still birth and 2(25%) were early neonatal death with perinatal mortality rate of 43/1000 live birth. Perinatal cause of death was obstructed labor, birth asphyxia, prematurity and cord accidents.

The result consistent with the result of the prospective study done in Jimma Hospital from June 1992- 24th 1993 showing that there was no maternal death, but the overall maternal morbidity rate was 20%. The causes of morbidity were wound infection (27.1%), sepsis (21.4%), and endometritis (33.3), hemorrhage (8%) & wound dehiscence (10%).

Wound infection(42.8%) in this study is higher when compared with the study conducted in Jimma Hospital(27.1%).(16) and the result also is higher when compare with the result of cesarean sections performed at Sultan Qaboos University Hospital (SQUH), Muscat, Oman, over a period of three years showing wound infection of 2.8% (20). This is probably because most of the women were from rural area who might have risk factors for wound infection like obstructed and use of pre-operative prophylactic antibiotics might have been omitted.

The gross perinatal mortality rate (PNMR) of 120/1000 live births was not statistically higher than the rate for all deliveries, which was 92.5%/1000 live births. The single most important cause of perinatal death was prolonged and obstructed labor (16).

Chapter seven

Conclusion and recommendation

7.1:- conclusion

The cesarean prevalence in this study was 18.2% and age groups range from 15-47 & 75.8% of them were within the range of 20-29 years with mean of 23.97 (SD±4.751). 71% of the patients were from rural area. The four common indications for C/S contributing for 89.3% were CPD(44.1%), non reassuring fetal heart rate pattern(18.3%), malpresentations(14.5), and repeated cesarean section(12.4 %) and C/S was done on emergency base in 96.2% of the study population. 146(78.5%) of the study population have <7 days length of the hospital stay with mean of 5.67 and SD±3.89 and the range of gestational age were from 32-44 with the majority of the women, 156(83.9%) were with the gestational age of 38-42 weeks with mean of 38.89 and SD±1.730 and 80.1% have ANC follow up from different health institution.

Neonatal weight in this study ranges from 1.4kg to 4.9 kg and majority of weight were ≥3.5kg 97(52.2%). Mean was 3.33 and SD±0.547. 170(95.5%) have normal APGAR score with mean of 7.94 and SD±1.916 .

165(88.7%) of them have good maternal outcome and 21(11.3%) of the study populations have bad maternal outcome (wound site infection, puerperal sepsis, hemorrhage, death and others); cause of death was anesthesia complication and 178(95.7%) have good fetal outcome and the remaining 8(4.3%) are new born with bad fetal outcome. Out of 8 new born with bad fetal outcome 6(75%) were still birth and 2(25%) were early neonatal death with PNMR of 43/1000 live birth. perinatal cause of death in this study was obstructed labor(12.5%), birth asphyxia(62.5%), prematurity(12.5%) and cord accidents(12.5%).

Based on Multivariate analysis length of stay in the hospital (p-value < 0.001, AOR 43.012 at 95% CI) was statistically significant for bad maternal outcome and only C/S indications (P-value 0.017, AOR 0.019 at 95% CI) and length of stay in the hospital(P-value 0.047 AOR 0.156 at 95% CI) were statistically significant for bad fetal outcome.

7.2:- recommendation

- Cesarean prevalence has to be reduced in the specific area of the study because it is higher prevalence when compared to the optimal cesarean rate proposed by WHO.
- Health workers at different health institutions in Illu Aba Bora Zone has to try their level best to prevent obstructed labor through effective ANC follow up by identifying women at risk to develop obstructed labor and refer them to the hospital set up with OR facilities as early as possible. Administrative bodies at Zonal level has to designed full referral system from primary health care units in order to prevent tertiary delay.
- CPD is the leading indication for cesarean section in Metu Karl Hospital according to the result of this study. Therefore; the hospital staffs has to prevent CPD through appropriate management of labor abnormalities by early intervention.
- Perinatal mortality rate has to be reduced using effective neonatal resuscitation and early intervention on women who have cesarean section indications before they develop obstructed labor.
- Strict aseptic techniques is mandatory when doing any surgery to prevent surgical site wound infections.
- Use of pro-operative prophylactic antibiotics has to be fully adopt by the hospital to reduce the occurrence of wound infection in the hospital.
- Card is center of information in health facilities. Therefore; strict card keeping has to be their daily activities to prevent lost of cards and detachment of information from cards.

References

1. F. Gary Cunningham, Kenneth J. Leveno, Steven L. Bloom, John C. Hauth, Dwight J. Rouse, Cathrine Y. Spong *Williams Obstetrics* 23rd ed. New York. McGraw-Hill Medical Companies; (2010).
2. R. James Scout. S. Ronald Gibbs. Y. Beth Karlan. F. Arthur. Danforth's obstetrics and gynecology 9th ed. copy right © Lippincott Williams and Wilkins (2003)
3. S. Elsevier. Hacker. Moore. Gambone *essentials of obstetrics and gynecology* 4th ed. 4E. www.studentconsult.com (2007)
4. S.G. Gabbe. R. Nieby. J. Leigh Simpson *obstetrics normals and problems pregnancies* 5th ed.
5. H. Segni. D. Niguse *Obstetrics management guideline in Jimma university specialized hospital* 1th ed. (sep. 2010)
6. A. Aisien. J. Lawson. A. Adebayo *A five year appraisal of caesarean section in a northern Nigeria university teaching hospital.* (dec. 1998)
7. C. Kathryn. H. Cortier. M. Fernando. M. Tshieteng. F. Nathan. *Cesarean section rate and indications in sub-saharan Africa.* Multi-country study from MSF. (Sep. 4, 2012)
8. Ado D. Geidam, Bala M. Audu, Bello M. Kawuwa, Jessy Y. Obed. Rising trend and indications of Cesarean Section at the University of Maidugri teaching hospital, Nigeria, *Annals of African Medicine* 2009; 8(2): 127-132.
9. Vincenzo Berghella. *Cesarean Delivery: Preoperative issues.* Up-to-date 19.3, September 6, 2011. <http://www.uptodate.com/index> (accessed 28 October 2012).
10. Saju Joy and David Chalmow. *The trends, overview, preoperative preparations and postoperative complications of CS.* <http://www.Emedicine.medscape.com> (accessed 1 July 2011).
11. Souza. CS without medical indications is associated with an increased risk of adverse short-term maternal outcomes: the 2004-2008 WHO Global survey on maternal and perinatal health. *BMC Medicine* 2010; 8(71): 1741-7015.

12. Althabe F, Sosa C, Belizan JM, Gibbons L, Jaquerioz F, Bergel E. Cesarean section rates and maternal and neonatal mortality in low-, medium-, and high income countries: an ecological study. *Birth*, 2006; 33(4): 270-7.
13. Fisseha N, Getachew A, Hailu M, G/Hiwot Y, Bailey P, A. national review of cesarean delivery in Ethiopia. *International journal of Gynecology & Obstetrics: the official organ of the International Federation of Gynecology & Obstetrics* 2011; 115(1): 106-111
14. Colin Mccord, Godfrey Mbaruku, Caetano Periera, Calist Nzabuha Kwa, Staffan Bergstorm. *The quality of emergency obstetric Surgery by assistant medical Officers in Tanzania District Hospital: Content.healthaffairs.org/lookup/re (accessed 29 October 2012).*
15. Tadesse E, Adane M, and Abiyou M. CS deliveries at Tikur Anbessa Teaching Hospital. *East Africa Medical Journal* 1996; 73(9): 619-22.
16. 17. Ali Y. Analysis of cesarean delivery in Jimma Hospital, *East Africa Medical Journal* 1995; 72(1): 60-3.
17. Yifru Birhan, Ahmed Abdel. Emergency obstetrics performance with emphasis on operative delivery outcome, *Ethiopian Journal of Health Development* 2004; 18(2): 96- 106
18. Charles E Denk, Kathryn P Aveni. *Maternal and Child health Epidemiology, Surveillance of maternal peripartum complications following CS.*www.state.nj.us/health/fhs/profession (accessed 29 October 2012).
19. Fay Menacher, Brady E. Hamilton: Recent trends in cesarean delivery in the United States. *NCHS Data Brief* 2010; 35: 1941-4927.
20. Mariam Mathew, Radha Kumari, Vlasta Vaclavinkova, Andrzej Krolikowski. Cesarean section at Sultan Qaboos University Hospital: a three year review, *SQU Journal of Scientific Research: Medical Sciences* 2002; 4(1-2): 29-32.
21. M.A. Ijaiya, P.A. Aboyeji. The trends of CS over a ten-Year period at Ilorin, Nigeria, *The Nigerian Journal of Surgical Research* 2001; 3(1): 12-18.

22. Yousif Mohamed, Lee Abdelfadil, Mahgoub Ziyada, Ahmed Abdelgadir, Abdelrahman Khalid, Abdelatif Ashmaig. The Pattern of Obstetrical and Gynecological Admissions in Ribat University Hospital, *Khartoum and Sudanese Journal of Public Health* 2006; 1(2): 112-116.
23. Zoe penn, Sadaf Ghaem-Maghani. Indications for Cesarean Section, *Best practice and Research Clinical Obstetrics and Gynecology* 2001; 15(1): 1-15.
24. Lydon-Rochell M. Association between method of delivery and maternal rehospitalization. *AIMS Journal* 2000;12(2): 2411-6.
25. Marian F. Mac Dorman, Eugene Declercq, Fay Menacker, Michael H. Malloy. Infant and Neonatal Mortality for Primary Cesarean and Vaginal Births to Women with “No Indicated Risk,” United States, 1998–2001 Birth Cohorts, *BIRTH* 2006; 33(3): 175-182.
26. Maaike A. P. C Van Ham, Pieter W. J. Van Dongen, Jan Mulder, Maternal consequences of CS. A retrospective study of intra operative and postoperative complication of CS during a 10-year period, *European Journal of Obstetrics Gynecology and Reproductive biology* 1997; 74(1): 1-6.
27. L.Gibbons.J.M.Belizan.J.A.Lauer *the global numbers and costs of additionally needed and unnecessary cesarean sections performed per year*. World health report (2010)
28. Trends in maternal health in Ethiopia challenges in achieving the MDG for maternal mortality *EDHS 2011 dec.2012 A.A* (UNFPA)
29. S.Gebremedhin trends and socio demographics differentials of caesarean section rates in Addis Ababa Ethiopia: *Analysis based on DHS data reproductive health journal* 2014, 11:14 <http://www..roproductive-health-journal.com/content/11/1/14>.
30. G.Asheber, perinatal mortality audit at Jimma hospital, south-western Ethiopia, 1990-1999 :*ethiopian journal of health development* 2000(3):335-3

Annexes

Annex 1:- Checklist

Jimma University, Collage of public health and medical science, department of integrated emergency obstetrics & gynecology and general surgery, checklist format on prevalence, indications and management outcomes of cesarean section in Metu Karl Hospital, Illu Ababora Zone Oromiya southern west Ethiopia, a retrospective study from Mar. 2013 to Aug. 2013.

PART 1: SOCIO-DEMOGRAPHIC DATA

No.	Questions	Coding Categories	Code
001	Age in years	<20	1
		20-29	2
		>=30	3
002	Residence	Urban	1
		Rural	2

PART 2: OBSTETRIC HISTORY

No.	Questions	Coding Categories	Code
003	Parity	1	1
		2-4	2
		>=5	3
004	GA in weeks	<38	1
		38-42	2
		>=42	3
005	Did the mother have ANC follow up	Yes	1
		No	2
006	Duration of labor in hours	<12	1
		12-24	2
		>=24	3
007	Type of Cesarean Section	Elective	1
		Emergency	2

008	Type of Uterine Incision	LUSTCS	1
		classical	2
009	Hgb. before operation in gm/dl	<10	1
		10-12	2
		>=12	3

PART 3: INDICATIONS OF CESAREAN SECTION

No.	Questions	Coding Categories	Code
010	C/S indications	CPD	1
		Obstructed labor	2
		Non reassuring fetal status	3
		Previous CS	4
		malpresentation	5
		APH	6

PART4: OUTCOMES OF CESAREAN SECTION

No.	Questions	Coding Categories	Coding
011	Maternal outcome	Alive with no complication	1
		Wound infection	2
		Puerperial sepsis	3
		Hemorrhage	4
		Organs injury	5
		Death	6
		Others, specify-----	7
012	Good maternal outcome	Yes	1
		No	2
013	Bad maternal outcome	Yes	1
		No	2
014	For Q 011 if answer is 6 what was the cause of death?	hemorrhage	1
		Sepsis	2
		Anesthesia complication	3

		Others specify:-----	4
		N/A	5
015	Hgb. after operation in gm/dl	<10	1
		10-12	2
		>=12	3
016	Was she transfused with blood?	Yes	1
		No	2
017	Length of stay in the hospital in days	<7	1
		>=7	2
018	Fetal outcome	Alive with no complication	1
		Still birth	2
		Early neonatal death	3
		Others, specify-----	4
019	For Q 018 if answer is 2&3 what was the cause?	Obstructed labor	1
		Birth asphyxia	2
		Prematurity	3
		Cord accident	4
		Others specify-----	5
		N/A	6
020	neonatal weight in kg	<2.5	1
		2.5-3.5	2
		3.5 &above	3
021	APGAR score in the 5 th min.	<7	1
		>=7	2
022	Good fetal outcome	Yes	1
		No	2
023	Bad fetal outcome	Yes	1
		No	2

Name of data collector ----- Date of data collection -----

Signature of data collector -----

Annex 2: - (a) prevalence of C/S in comparison with that of MKH

Open EPI software summery output at 95% Confidence Limits for Proportions

C/S/total deliveries	C/s prevalence in MKH (186/1023)	C/s prevalence in Jimma Hospital (100/1236)	C/s prevalence in ATAH (318/3237)	C/s prevalence in Jos University Teaching Hospital in Nigeria (2083/11571)	National review of C/S in Ethiopia (267/1483)
Upper limits	20.64%	9.711%	10.89%	18.71%	20.02%
Proportion (percentage)	18.1818%	8.09061%	9.82391%	18.0019%	18.004%
Lower limits	15.91%	6.666%	8.834%	17.31%	16.11%

(b):- CPD as common indication for C/S in comparison with that of MKH .

CPD/ total C/S	CPD cases in MKH (82/186)	CPD in Jimma Hospital (44/100)	CPD in ATAH (93/318)
Upper limits	51.29%	53.83%	34.43%
Proportion (percentage)	44.086%	44%	29.2453%
Lower limits	37.07%	34.51	24.44%