

**PREVALENCE AND OUTCOMES OF CEASAREAN SECTION IN ATTAT
HOSPITAL, GURAGE ZONE, SNNPR, ETHIOPIA.**

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ABSTRACT

Background: Cesarean-delivery has played a major role in lowering both maternal and perinatal morbidity and mortality rates. Rates of cesarean section are of concern to both developed & developing countries. The global cesarean delivery rate is distributed very unevenly and results 15 % of abdominal delivery. The rate ranges 2% in least developed countries to 21.1% in developed countries. The four most common indications for cesarean delivery which account for approximately 80 percent of these deliveries include: failure to progress during labor, previous hysterectomy, nonreassuring fetal status and fetal malpresentation. Complications and consequences associated with CS include infectious and noninfectious complications.

Objective: To determine the prevalence, common indications, outcomes and complications of cesarean section in Attat Hospital.

METHODES: Facility based cross-sectional study was conducted in Attat Hospital, Gurage zone SNNPR, Ethiopia from January/2011 –December/2013GC. Data was collected using structured questionnaire by trained data collectors. The collected data was checked for their completeness, entered, edited, cleaned and analyzed by SPSS Verssion20. Chi- square test, 95% CI and P-value <0.05 were used to examine association between dependent and independent variables.

Result: The prevalence of cesarean section is 27.6%. The age of the patients ranged between 16-45years with a mean age of 28.12 years (SD±5.14). The leading indications for cesarean birth were, Cephalopelvic disproportion (CPD) (38.1%), previous CS (18.9%), fetal distress (12.5%), malpresentation and malposition (7.1%), and antepartum hemorrhage (APH) (6%) accounting for 82.6% of the indications for cesarean section. Maternal indications constituted 191 (68%) whereas fetal indications accounted for 90 (32%). There was only one (0.4%) maternal death, but the overall maternal morbidity rate was 9.6%. The gross perinatal mortality rate was 64/1000 live births which was statistically higher than 2011 national report for all deliveries, which was 46/1000 live births.

Conclusion: Although the Cs rate of 27.6% is high, the perinatal outcome was not improved. Cesarean sections performed for appropriate medical or obstetric indications are life saving for both the mother as well as the new born. Therefore to reduce the high prevalence of Cs, each case should be thoroughly evaluated to determine the possibility for vaginal delivery.

Recommendation: Trial of vaginal birth after Cs for appropriate cases, BTL for cases with more than 3 scars, conservative management of fetal distress other than intervention for a single episode and avoidance of malnutrition and poverty by enhancing food security are recommended to reduce the high rate of cesarean delivery. Routine use of prophylactic antibiotics is recommended to reduce post-operative complications

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ACRONYMS

ANC----- Antenatal Care

APH-----Antepartum Hemorrhage

APGAR -----Appearance, Pulse rate, Grimace, Activity and Respiratory rate.

BTL -----Bilateral Tuba Ligation

CS ----- Cesarean Section

CD-----Cesarean Delivery

CI -----Confidence Interval

CSA-----Central Statistics Association

CPD----- Cephalopelvic Disproportion

EDHS----- Ethiopian Demographic Health Survey

CEMOC-----Comprehensive Emergency Obstetric Care

ERCS-----Ethiopian red cross society

FGAE-----Family Guidance Association of Ethiopia

FHB-----Fetal Heart Beat

GA-----Gestational Age

GC----- Gregorian Calendar

GYN----- Gynecology

HCT-----Hematocrit

HIV -----Human Immune Deficiency Virus

ICU----- Intensive Care Unite

IEOS----- Integrated Emergency Obstetrics and Surgery

IUFD-----Intra Uterine Fetal Death

LNMP-----Last Normal Menstrual Period

LUSTCS----- Lower Uterine Segment Cesarean Section

MMR-----Maternal Mortality Ratio
NGO-----Nongovernmental Organization
NICU-----Neonatal Intensive Care Unit
PE/EC-----Preclaptia-Eclaptia
PRMR-----Perinatal Mortality Rate
SNNPR-----Southern Nation and National People Region
SQUH -----Sultan Qaboos University Hospital
VBAC-----Vaginal Birth after Cesarean section
WHO-----World Health Organization
UK-----United Kingdom
USA-----United States of America
UTI-----Urinary Tract Infection

CHAPTER ONE: INTRODUCTION

1.1. Background

Cesarean section refers to the delivery of a fetus, placenta and membrane through the abdominal and uterine incision after 28 weeks of gestation (1).

Cesarean delivery has played a major role in lowering both maternal and per natal morbidity and mortality rates during the past century. The initial purpose of the surgery was to preserve the life of the mother with obstructed labor, but indications have expanded over the years to include delivery for a variety of more subtle dangers to the mother or fetus. Contributing to its more frequent use is its increased safety, which is largely a result of better surgical technique, improved anesthesia, effective antibiotics, and availability of blood transfusions (2).

Rates of cesarean section are of concern both in developed and developing countries. The global cesarean section rate is distributed very unevenly and results 15% of abdominal delivery. Latin America and Caribbean shows the highest rate (29.2%) and Africa shows the lowest (3.5%). In developed countries the proportion of cesarean birth is 21.1% whereas in least developed countries only 2 % of deliveries are by cesarean section. The analysis suggests a strong inverse association between cesarean section rates and maternal, infant and neonatal mortality in countries with high mortality levels. In many developed countries, cesarean sections are increased and attention has focused on strategies to reduce its use do to the concern that higher cesarean section rates do not confer additional health gain but may increase maternal risk, have implications for future pregnancies and have resource implications for health service (3, 4, 5).

In Ethiopia the cesarean section rate of the country based on 2010 report is only 1% (6) .The CS rate in some specified hospitals of the country such as Black Lion Teaching Hospital is around 10%in 1992(7). At this specific hospital there is no published study on this area of study.

1.2 Statement of the problems

Cesarean section was introduced in clinical practice as a lifesaving procedure both for the mother and the baby. As other procedures of some complexity, its use follows the health care in equality pattern of the world; underuse in low income settings and adequate or even unnecessary use in middle and high income settings (8, 9).

Cesarean Section rates were obtained for 137 countries from 192 United Nations member states of the world, representing 95% of global births in the year 2008. Approximately 18.5 million cesarean sections are performed yearly worldwide. About 40% of the countries have CS rates <10%, about 10% have CS rates between 10 and 15%, and approximately 50% have CS rates >15%. This analysis shows that every year in the world there is an additional need for 0.8 – 3.2 million CS in low income countries where 60% of the world's births occur. Simultaneously, 4.0-6.2 million CS in excess are performed in middle and high income countries where 37.5% of the births occur. From a population based approach, those CS in excess are likely to be medically unjustified and should be then considered unnecessary CS (10).

The world health organization (WHO) published guide lines in 1985 suggesting that cesarean section rates should not exceed 15%.but revised these in 1994, suggesting that rates should be between 5-15%. Debate around these numbers has centered on implications that rates under 5% suggest that perhaps the population does not have sufficient access to lifesaving care (11,12).

Socioeconomic status is also an important indicator of access to obstetrical care and this too can be evidenced in rates of cesarean section. Studies from developing countries have shown that in some populations, cesarean sections amongst the poorest 20% of the population are less than 1 %, clearly indicating insufficient access to life saving care. The Caesarean rate in industrialized countries is high. It was about 22.7% in the UK in 2004 (11). In contrast, the population-based Caesarean rate in rural sub-Saharan Africa is very low at about 1%. In this area, however, the majority of deliveries take place outside hospitals and the hospital-based Caesarean rates have been reported to range between 5 and 22%. Maternal morbidity and mortality have remained high in many developing countries.

Caesarean sections performed appropriately and following an appropriate medical indication are potentially life-saving procedures. In this context, the provision of timely and safe caesarean

sections in high maternal mortality countries is a major challenge faced by local health systems (10). As an effective means of reducing maternal mortality the provision of Caesarean sections for all women who need them has been considered.

Early and timely identification of the indications of CS saves the life of both the mother and the newborn. The main intervention to prevent the most common complication of CS (infection) is administering pre-operative antibiotic prophylaxis which decreases the risk of infection by 5%, good aseptic and surgical techniques (13).

A study done on a national review of cesarean delivery in Ethiopia showed that maternal indication accounted for 66% of the cesareans reviewed and fetal indication for 34% (17). According to the studies in different parts of the country, the indications for cesarean deliveries were: repeat CS, CPD, placenta previa, Abruptio placenta, fetal distress, malposition and malpresentation (7, 18).

Caesarean sections are not without complications and consequences. Compared with a vaginal delivery, maternal mortality and especially morbidity is increased with cesarean delivery to approximately twice the rate after a vaginal delivery. The overall maternal mortality rate is 6-22 deaths per 100,000 live births, with approximately one third to one half of maternal deaths after cesarean delivery being directly attributable to the operative procedure itself. Part of this increase in mortality is that associated with a surgical procedure and, in part, related to the conditions that may have led to needing to perform a cesarean delivery. Major sources of morbidity and mortality can be related to sequel of infection, thromboembolic disease, anesthetic complications, and surgical injury (13).

In our country, the most common complications following CS include maternal death, wound infection, sepsis, endometritis, hemorrhage, wound dehiscence and Perinatal death. The most common causes of prenatal death are prolonged & obstructed labor (7, 18).

Several studies have shown an inverse association between CS rates and maternal and infant mortality at population level in low income countries where large sectors of the population lack access to basic obstetric care. On the other hand, CS rates above a certain limit have not shown additional benefit for the mother or the baby, and some studies have even shown that high CS rates could be linked to negative consequences in maternal and child health. Therefore, to

alleviate these consequences, in 1994 WHO stated: the acceptable CS rate worldwide to be 5-15% (12). If CS rate of a given country is less than 5%, it is considered under use, but if it is greater than 15% over use or excess of CS will be considered. But, this conclusion has its own limitation or gap because the adequate range for the CS rate in a country remains a matter of debate (10). In our country, the CS rate is still below WHO range. The Ministry of Health of Ethiopia (EMOH) had set out different interventions like comprehensive emergency obstetric care (CEMOC) to alleviate poor access to life saving procedures including CS and blood transfusion (22).

The neonatal mortality and maternal mortality rate of Ethiopia is 37/1,000 live births and 676/100,000 mothers respectively. Based on 2011 EDHS report the institutional delivery rate of the country increases from 5 % in 2005 to 10 % in 2011 and ANC visit at least once become 34%. (23,24). The cesarean section rate at national level is 0.6% with a range from 0 to 9.9% among regions. (25, 26). The overall institutional rate was 18%, which varied between 46% in the private for-profit sector and 15% in the public sector (10). The value varies significantly among urban and rural as well as educated and none educated.

The reason for undertaking this research study is based on the fact that in areas with a high rate of maternal mortality and morbidity from poor access to CEMOC, knowing the prevalence, indications and pregnancy outcomes of operative delivery particularly CS is crucial. Therefore this study is aimed at providing information on the prevalence, indications and outcomes of CD in Attat Hospital that plays a vital role in reducing maternal mortality and morbidity resulting from complications related with pregnancy that needs urgent surgical intervention. In addition to this the shortage of complete and adequate data on prevalence, indication and outcome of cesarean section at this Hospital as well as in the country level makes me to study on this topic at this specific Hospital. As a result the information on this issue will help the hospital Staff to know the trends, common indications and outcomes of pregnancy after CS as well as the managers to allocate their resources on the most common priority areas. The study result will also help other stakeholders (NGOs) working in this line. The best practices in the Hospital may also help other researchers, Zonal health departments, SNNPR and the country at large

1.3. Significance of the study

In general maternal & neonatal morbidity and mortality in developing countries especially in Sub-Saharan country are very high. Ethiopia as a member of sub Saharan African country contributes a huge number in maternal & neonatal morbidity and mortality; to reduce this and to achieve the millennium development goal the country works hard in a multi directional way this includes the accessibility of compressive obstetric care in health institutions, in doing so cesarean section should be performed in those health institutions for scientific reason based on the WHO recommendation rate ,additionally cesarean section should improve and contribute in the reduction maternal & neonatal morbidity and mortality of the hospital as well as the country. Hospitals should have base line study on prevalence and outcome of cesarean section in order to assess the progress through time for further study and intervention. There was no adequate research on this area of study at this hospital .Therefore, it was important to do this research to provide background data for further study and forward some recommendations based on the findings.

CHAPTER 2: LITRATURE 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 WHO's suggested minimum cesarean rate of 5% (10, 12). The most common indications for CD in developed and developing countries include: failure to progress during labor, previous CS and other uterine surgery, non-reassuring fetal status, malpresentation, APH, pregnancy induced hypertension and multiple gestations (14). CS has risks for the mother and the neonate. Risks of certain per partum 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 (33).

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 (13). 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) (34).

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 WHO's suggested minimum cesarean rate of 5% (12).

Review of the caesarean 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 caesareans were at term and done under general anesthesia (35).

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)(30). 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 CS rate of 9.1%. Cesarean birth rose from 1 in 26 deliveries in 1990 to 1 in 5 deliveries by 1999 (36).

A prospective study conducted in TikurAnbessa 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 primiparae, 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 CS. Fifty seven (18 %) had elective CS and 261(82%) were emergency CS (17). A comparative study in TikurAnbessa hospital by Ayalew (unpublished data from the department of Obstetrics and Gynecology of the study hospital) has shown that the caesarean section rate increased from 7.7% in 1986/1987 to 25.6% in 1998/1999 (22).

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% (18).

According to WHO report on maternal and neonatal health in Ethiopia, the latest data in 2005 indicated that 1% of births were delivered by CS. In two surveys, the C-section rate was higher

among women residing in urban areas than their rural counterparts. The percentage of births delivered by CS in urban areas was 5.1% and 9.4% in 2000 and 2005 respectively. But the percentage of births delivered by CS in rural areas was 0.2% and 0.3% in 2000 and 2005 respectively giving the total percent of births delivered by CS 0.7% and 1% in 2000 and 2005 respectively. By sub regional level, according to the latest data in 2005, the C-section rate varied from a low of 0.1% in BenishangulGumuz to a high of 16% in the Capital city Addis, showing substantial intra-country disparity in accessing C-section (11).

One of the limitations of research regarding the rate of CS is; there is still debate to what extent the cutoff point or acceptable range of the prevalence of CS. This needs further research to reach on agreed point. The strength of the above research findings concerning the rate of CS is the lower the prevalence of CS the increased risk of maternal and neonatal morbidity and mortality which is common in low in-come countries including our country. Therefore this study helps to know the prevalence of CS in Attat Hospital.

2.1.2 Indications of Cesarean Delivery

Rates of caesarean section are rising, however, and the rates for various indications vary widely. Currently, in the developed world, approximately 30% of caesarean sections are repeat caesarean sections after primary caesarean section, 30% are performed for dystocia, 11% are performed for breech presentation and 10% are performed for fetal distress. In some South American countries section rates are said to be as high as 80%.The phenomenon of caesarean sections performed for maternal choice alone, in the absence of any obstetric, medical or fetal indication, merely highlights the fact that the indications for caesarean section have become increasingly relaxed and are nearly all relative (with some obvious exceptions)(37).

Review of the caesarean sections performed at Sultan Qaboos University Hospital (SQUH), Muscat, Oman, over a period of three years shows the following findings. The most common indication for primary C/S was fetal distress 134(32.1%) followed by breech presentation 78(18.7%). For repeat caesareans, two or more previous C/S 137(44.2%) followed by fetal distress 29(9.4) were the most common indication (35).

A retrospective study from 2000-2005 conducted in Nigeria (at Maiduguri Teaching Hospital) showed also that the major maternal indications were, CPD (15.5%), previous cesarean section (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 (30). Another retrospective study performed on the trends of cesarean delivery over a 10– year period at Ilorin, Nigeria showed Cephalopelvic disproportion (CPD), 851(30.8%) remained the commonest indication for CS throughout the study period. The other indications were antepartum hemorrhage (APH) 363(13.1%), failed induction 296(10.7%), pre-eclampsia/eclampsia, 258(9.3%) and fetal distress 237(8.6%) (36).

A prospective study conducted in TikurAnbessa Hospital showed that The leading or the major indication for abdominal deliveries were repeat cesarean section 103(32.4%), cephalopelvic disproportion (CPD) 93(29.2%), placenta previa and abruptio placenta 40(12.6) (7). A comparative study in TikurAnbessa 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 caesarean section (29.7%) in 86/1987 to fetal distress (26.6%) in 1998/1999 (22).

Another prospective study from June 1992- 24th 1993 conducted on analysis of cesarean delivery in Jimma Hospital showed thatthe leading indications for cesarean birth were, cephalopelvic disproportion (44%),malpresentation, malpositions (21%), repeat cesarean section (16%), antepartum hemorrhage (8%) and fetal distress (6%) accounting for 95% of the indications for cesarean section (18).

The limitation of research findings on indications of CS is taking maternal request as one of the indication for CS without actual medical or obstetric indication. Whether cesarean delivery on maternal request is an indication for CS is still on debate. The strength the study is appropriate medical or obstetric indications of CS with timely intervention saves the life of both the mother and the baby.

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 rehospitalization, 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(34).

A retrospective study of intraoperative and post-operative maternal complications of CS during a 10- year period in Europe indicates the overall maternal intraoperative 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 (5.2%, minor 34%). Inclusion emergency CS carried the greatest risks regarding maternal complication compared to elective procedures (38).

Review of the caesarean sections performed at Sultan Qaboos University Hospital (SQUH), Muscat, Oman, over a period of three years shows the most common complications of CS were fever, 182(25.0%), blood transfusion, 62(8.5%) wound infection 20(2.8%) and urinary tract infection. 11(1.5%) (35).

Another retrospective study performed on the trends of cesarean delivery over a 10- year period at Ilorin, Nigeria showed the common causes of CS 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 CS and vaginal delivery respectively. All cesarean mortality cases recorded were under emergency situations. Maternal mortality ratio relating to CS (1,050/100,000) was higher than that for vaginal delivery (40/1000) (36).

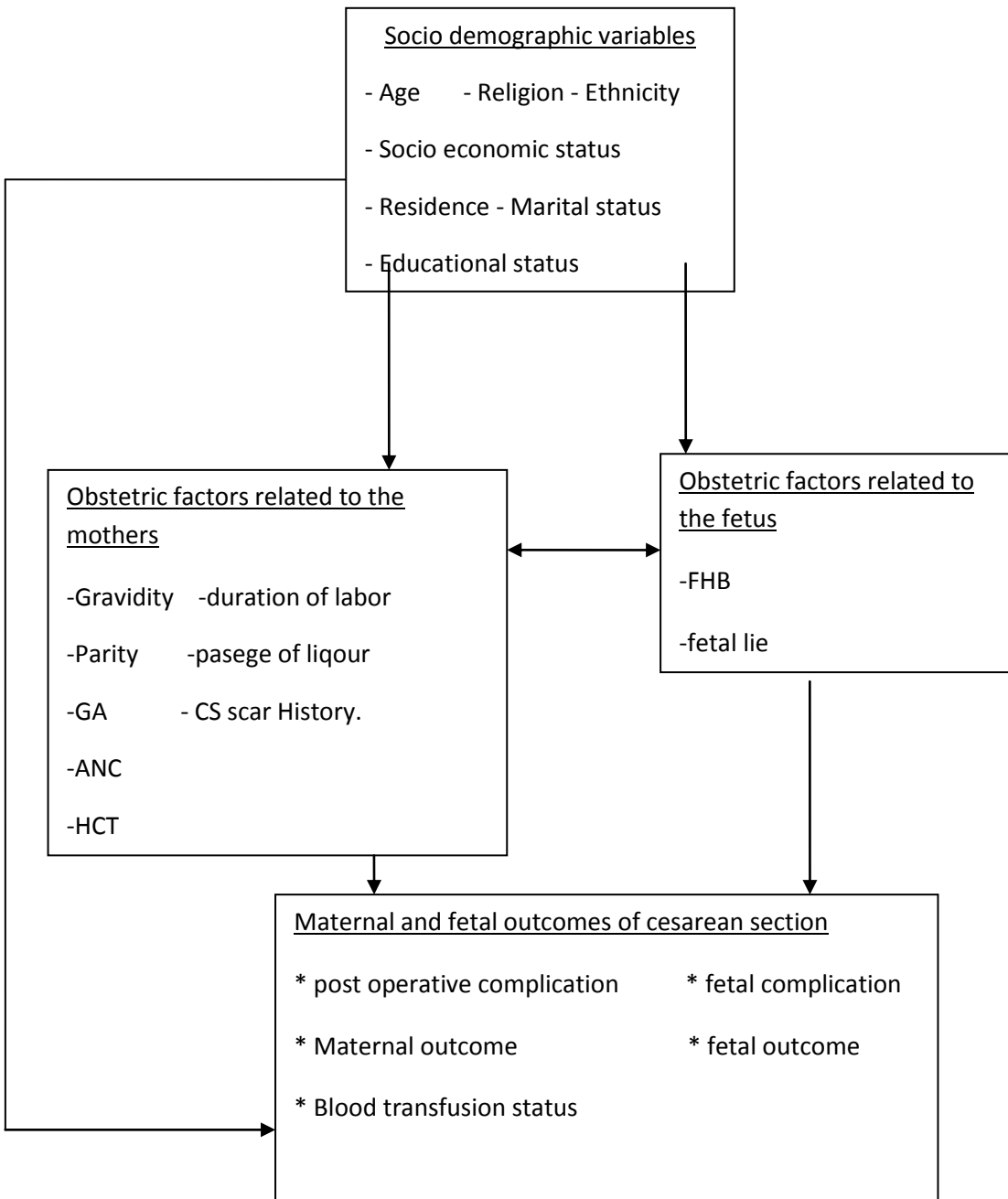
A prospective study conducted in Tikur Anbessa Hospital showed that on eight (2.5%) of the patient obstetric hysterectomy was performed. There were five maternal deaths among CS cases. The main cause of maternal death was failure to control bleeding during the CS. There were 9(2.8%) still births and 15(4.7%) early neonatal deaths. The mean birth weight among booked CS was 3108grams and un booked 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 (7).

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 (18).

2.2: conceptual frame work

Diagram 1. Conceptual frame work for cesarean section outcome and related factors.



CHAPTER THREE: OBJECTIVE

3.1 General objective

- To determine the prevalence, common indications, outcomes and complications of cesarean section at Atat hospital from January 2011 –December 2013 G.C.

3.2 Specific objective

- ✓ **To determine the prevalence of cesarean section at ATAT Hospital.**
- ✓ To determine the common indications of cesarean section at ATAT Hospital.
- ✓ To assess the outcomes of cesarean section at ATAT Hospital.
- ✓ To identify post-operative complications of cesarean section in ATAT Hospital and
- ✓ To identify risk factors of cesarean section in ATAT Hospital.

CHAPTER FOUR: METHODS AND MATEREIALS

4.1 Study Area and period

All cesarean sections performed at Attat hospital, Gurage Zone, and SNNPR, from January 2011 – December 2013 G.C inclusive were reviewed. The Attat Hospital integrated service is located 187km south west of Addis Ababa along the Jimma road in the Southern region of Ethiopia Gurage Zone and Chiha Woreda. It is located 17km away from welkite town on the road to Hossana. The service has been operative since 1969. The service is owned by the Ethiopian Catholic Church and is managed by Medical Missions sisters an international religious congregation. Gurage Zone is a densely populated rural area with approximately 359-400 inhabitants per square kilometer. The aim of the Hospital is to support those living in rural areas having poor access to health care services. The total number of population in the catchment area is 800,000. Out of this the number of women in the reproductive age group (15-45 year) is 192,000 and the expected number of deliveries per year is 29,600. On the preventive aspect the project is responsible for 10 Peasant Associations with a target population of about 32,000. There are 35 Health Centers and five Clinics from nine woredas and welkite town using the Hospital as referral center. The nearest Hospitals are St Luke's Hospital in Wolliso, 60km away, and Hossana Hospital, 120km away. The Hospital has 65 beds. In addition, there are 48 beds in the Maternity Waiting Area, 13 beds in the Nutrition Rehabilitation Unit, 3 Labour Beds and 2 Delivery Beds that are often used as overflow beds. Normal deliveries return home within 24 hours or stay in the Postnatal Room of the MWA when necessary. The obstetric/gynecology post-operative cases go to the Surgical Ward. Maternity and Gynecological services are the main surgical procedures done. Elective and emergency surgical services are performed. There are 1 obstetrician/gynecologist, 1 surgeon, 3 GPs, 2 Health officer, 1 health coordinator, 2 pharmacists, 4 druggists, 44 nurses, 7 lab technicians and 14 other health professionals. There are 87 support staff members.

4.2 Study design

Hospital based cross-sectional retrospective study was conducted from January 2011 – December 2013 G.C.

4.3 Population

4.3.1 Source population

All mothers gave birth by cesarean section at Atat Hospital from January 2011 – December 2013 G.C.

4.3.2 Study population

All mothers gave birth by cesarean section at ATAT Hospital from January 2011 – December 2013 G.C.

4.3.3 Inclusion and exclusion criteria

Inclusion:

- ❖ All cesarean deliveries including elective, emergency, primary and repeat cases
- ❖ Cesarean deliveries performed after period of viability (28 week)

Exclusion:

- ❖ Cesarean deliveries which lack full information

4.4 Sample size determination and sampling technique

4.4.1 Sample size determination

According to 2011 Annual Report of Attat Our Lady of Lourdes Catholic Hospital Integrated Health Service, the percentage of CS was 27%. Therefore, P can be taken as 27%, (from Attat Hospital 2011 Annual Health Service Report). Therefore using 5% error & 95% CI, the sample size can be calculated as follows.

$$N = z^2 p (1-p) / w^2$$

Where Z=1.96(standardized normal value at 95% CI)

P= Percentage of CS in Attat Hospital

d= 0.05, degree of accuracy desired (Fisher et al., 1991).

= margin of error=5%

$$1.96^2(0.27 \times 0.73) / (0.05)^2$$

$$n=303$$

Since the above sample is to be taken from a relatively small population (N= 1610), the required minimum sample was obtained from the above estimate by making some adjustment.

$$nf = ni/(1+(ni/N))$$

$$nf = 303 / (1 + (303/1610)) = 255$$

By adding 10% of 255 the study subjects were 281

4.4.2 Sampling technique:

First, the registration books and cards of total number of Cesarean sections performed in 3 year period (from JANUARY 2011 – December 2013 G.C.) were identified and arranged in order from year 2011 to 2013. Probability sampling technique was used to identify cards which are the target cards for this particular study.

Systematic random sampling was used to select and approach study subjects who undergone Cesarean section during the study period. The sampling fraction (K^{th}) was 6 ($1610/255=6$), every 6th women in each year until the allocated sample size was included in the study. Based on the patients' card number a starting patient was determined by using simple random sampling.

4.5. Data collection and measurement

4.5.1 Variables

Independent variables

Age, residence, gravidity, parity, LNMP, ANC follow up, GA, duration of labor, fetal lie, FHB, station, pre-operation HCT, cesarean section type.

Dependent variables-

Post operation complications, fetal outcome, maternal outcome, blood transfusion, post operation HCT.

4.5.2 Data collection instrument and pretesting

The data for the study was collected using pre-tested structured questionnaire which have socio-demographic variables, obstetric history and outcome of cesarean section. The questionnaire was prepared in English.

Pre- test

Before the actual data collection, the questionnaire was tested on 5% of the total study that delivered by cesarean section during study period.

4.5.3 Data collection procedure

Information obtained from theatre records, labor ward records, & neonatal ward records using structured questionnaire.

4.6. Data processing and analysis

The collected data was entered to and analyzed by using SPSS version 20. It was checked for its completeness, cleaned and analyzed accordingly. Frequencies and graphs were used to describe some variables. Bivariate analysis and chi-square test were used to examine association between dependent and independent variables. A 95% CI and p-value of <0.05 were considered to be statistically significant. In addition crude /adjusted odd ratios were calculated. To assess the effects of each independent variable on the outcome variables multivariate logistic analysis was carried out with p-value of <0.1 and fit to the final model.

4.7 Ethical considerations

Letter of ethical clearance was obtained from Research Ethical Committee of Jimma University and from the coordinator of integrated emergency obstetrics/Gyn and surgery.

The information found in the patient chart was kept secured or confidential and the information was used only for this study purpose.

4.8 Data quality assurance

To keep the quality of data detail trainings was given for data collectors, day to day activities during data collection was supervised and evaluated errors were corrected by the investigator before the following day activity. And to have good quality, health professionals were selected for data collection.

4.9 Limitations of the study

- ❖ The study may not show long term complications.
- ❖ Study may not be representative of the whole population in the study area.

4.10. Operational definitions

Gestational age- duration of pregnancy in weeks :is calculated from the LNMP or fundal height that was documented on the card, if not from the duration of amenorrhea documented from mothers recall & is rounded to the nearest weeks. Amenorrhea of 9 months was taken as 37-42 weeks gestation for all mothers.

Birth weight- is taken from the record in delivery note & it is rounded to the nearest two decimals in kg & categorized according to the standard classification.

CESAREAN SECTION- delivery of the fetus, membrane and placenta after 28 weeks of gestation by opening of abdomen and uterus.

Elective Cesarean section: that is performed before the onset of labor or before the appearance of any complication that mandates an urgent delivery.

Emergency Cesarean section: that is performed after the onset of labor or appearance of a complication that mandates urgent delivery.

Primary Cesarean section: C/S is one that is done for the first time.

Repeat Cesarean section: is the one that is done for more than one time.

Gravidity: - the total number of pregnancies includes abortion, ectopic pregnancy and any other pregnancies. (twin pregnancies considered as one pregnancy)

Parity: - number of deliveries after 28 weeks of gestation including IUFD and still birth (abortion, ectopic pregnancies and etc. are not included)

Duration of labor: - Total time from initiation of labor to CS performed.

Favorable/Good neonatal outcome: neonates born alive with good Apgar scores.

Poor/unfavorable neonatal outcome: still born or END or infants with any other complications.

Good/Favorable maternal outcome: mothers with smooth post-operative condition after c/s

Poor/unfavorable maternal outcome: includes mothers who developed post-operative complications after c/s and death.

ANC follow up; Yes: mothers who have had at least one follow up or registered as “Yes”

No: no ANC follow up at all or registered as “No ANC follow up”

Maternal death: is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.

Perinatal mortality rate: is most often defined as fetal death that occurs between the periods from the 28th wk of gestation through the 7th day after birth.

Cephalopelvic disproportion: This may occur at the inlet, mid-cavity or at the outlet. It may be due to an absolute contracted pelvis or it is relative due to a malposition malpresentation or fetal macrosomia (≥ 4000 gms).

Malpresentation: encompasses any fetal presentation other than vertex, including breech, face, brow, shoulder, and compound presentations.

Antepartum hemorrhage: genital tract bleeding from 28th week of gestation till delivery of the fetus. APH due to placenta previa and abruptio placenta with indications for CS are mainly considered in this study.

Failed induction: is diagnosed when there has been no cervical change or descent of the presenting part after 6-8 hours of labor or contraction of 3 in 10 minutes has not been achieved.

Prematurity: Live born infants delivered before 37 week from the 1st day of the last menstrual period are termed premature by the World Health Organization.

4.11 Plan for dissemination of findings

The result of the study will be presented to Jimma university community as part of IEOS thesis; and it will be disseminated to JU College of public health and medical science, coordinating office of Integrated Emergency OBS/GNY and Surgery, Regional health bureau, Zonal health offices, to the targeted health facility and to NGOs working on this area. Further attempt will be made to publish it on national and international scientific journals.

CHAPTER FIVE: RESULT

During the period of study, there were 5,611 deliveries at Attat Hospital, of which 1,547 were by C/S, an incidence of 27.6 percent. The age of the patients ranged between 16-45 years with a mean age of 28.12 years with $SD\pm 5.14$. Majority of the patients were between 20-35 years 236(84%) , the rest were younger than 20 age years 27(9.6%) and older than 35 years 18(6.4%). Eighty seven (31%) of the mothers were primipara, 179(63.7%) were between Para one and Para four and 15(5.3%) were grand multipara.. Thirty two (11.4%) of mothers with C/s did not have ANC follow up in any health institution. Fifty nine (21%) and 260(79%) of the women were from urban and rural respectively. Table1 shows patients who had Cs were categorized according to age, parity and residence.

Table 1: Cesarean section cases by socio-demographic Characteristics, Parity and ANC follow up in Attat Hospital, Gurage Zone, SNNPR, Ethiopia, July 2014

Variables	Number	percentage
Age (Years)		
<19	8	2.8
20-34	218	76.6
≥35	55	19.6
Total	281	100
Parity		
Primigravida	88	31.3
Para (1-4)	178	63.3
Grandmulti	15	5.4
Total	281	100
LNMP		
Yes	114	40.6
No	167	59.4
Total	281	100
ANC Follow up		
Yes	249	88.6
No	32	11.4
Total	281	100
Residence		
Urban	59	21
Rural	222	79
Total	281	100
Marital status		
Married	277	98.6
Single	4	1.4
Total	281	100

One hundred nineh three (68.7%) of the mothers had primary CS while 88(31.3%) had repeat cs. The majority of Cs were emergencies-254(90.4%), whereas 27(9.6%) were elective. All of

uterine incisions were lower uterine segment transverse cs. Bilateral tubal ligation (BTL) was done for 36(12.8%) of the mothers. Out of the total BTL cases, 19(52.8%) of BTL was done for repeat C/s cases while 17(47.2) was done for primary C/s cases.). Preoperative hemoglobin was done for the majority of Cs cases 270(96.1%). Most Cs cases were done under Spinal anesthesia 225(80.1%). Out of the 281 Cs cases 244(86.8%) were term pregnancies, 28(10%) were preterm and 9(3.2%) were postterm.

Table 2: Type of Cs, anesthesia and preoperative hemoglobin status of cesarean sectioned cases in Attat Hospital, Gurage Zone, SNNPR, Ethiopia, July 2014

Variables	No. of CS	Percentage
Type of CS		
Elective	27	9.6
Emergency	254	90.4
Total	281	100
Primary	193	68.7
Repeat	88	31.3
Total	281	100
Bilateral tubal ligation		
Yes	36	12.8
No	245	87.2
Total	281	100
PREOP HGB		
7-11gm/dl	22	7.8
>11gm/dl	248	88.3
Not done	11	3.9
Total	281	100
Type of anesthesia		
General anesthesia	56	19.9
Spinal anesthesia	225	80.1
Total	281	100
Gestational Age in weeks		
<37	28	10
37-42	244	86.8
≥42	9	3.2
Total	281	100
Duration of labour in hours		
<12	99	35.2
12-24	100	35.6
>24	50	17.8
Not in labour	32	12.4
Total	281	100

The leading indications for cesarean birth were, Cephalopelvic disproportion (CPD) 107(38.1%), previous Cs 53(18.9%), fetal distress 35(12.5%), malpresentation and malposition 20(7.1%), and antepartum hemorrhage (APH) 17(6%) accounting for 82.6% of the indications for cesarean section. Figure 1: below shows graphical representation of indications of cesarean section.

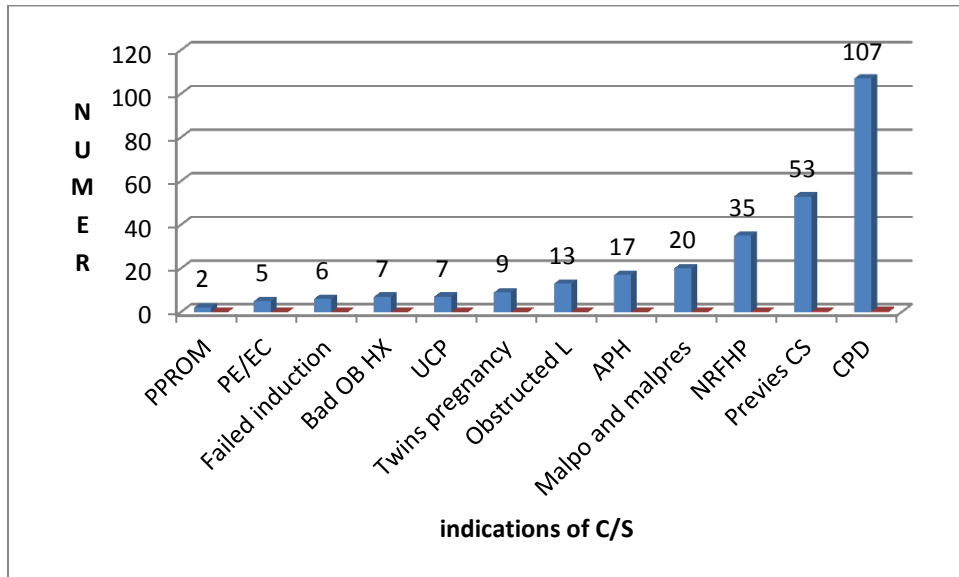


Figure 1: Indication of CS in Atat hospital during the stud period.

The indications for CS can be maternal or fetal. Maternal indication constituted 191(68%) whereas fetal indications accounted for 90(42%). The leading maternal indications were CPD 88(31.3%), previous Cs 53(18.9%), APH 17(6%) and obstructed labor 13(46%). Figure: 2 below show maternal indication of C/S.

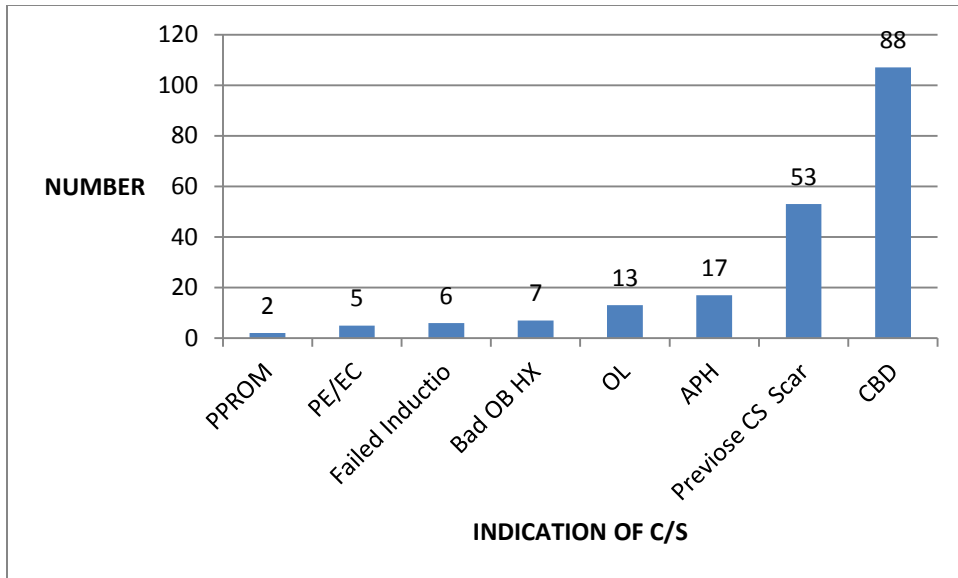


Figure 2: maternal indication of CS in Atat hospital during the stud period.

Major fetal indications include fetal distress 35(12.4%), malpresentation & malposition 20(7.1%), macrosomia 19(6.8%) and pregnancy complicated by twin pregnancy 9(3.2%). Figure :3 below show fetal indications of C/S.

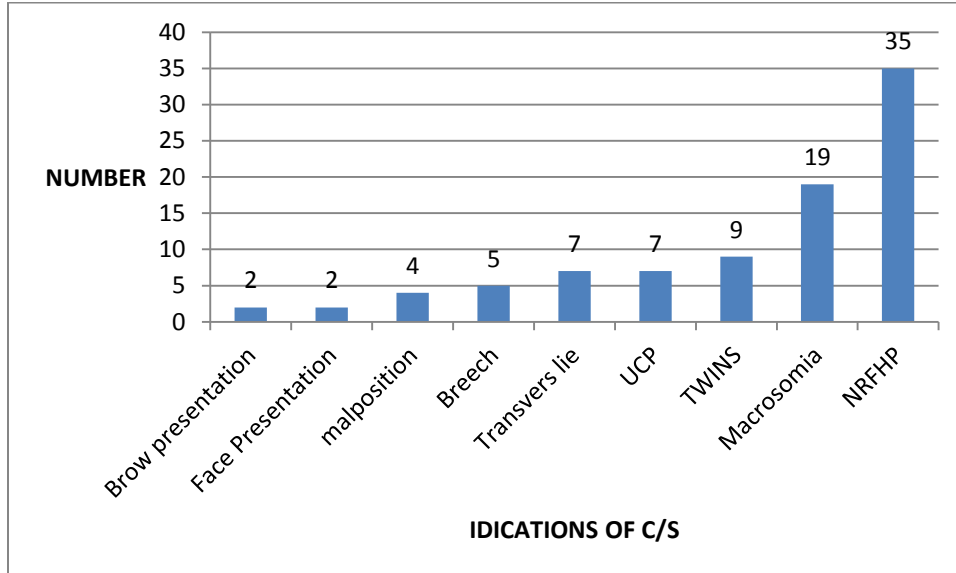


Figure 3: Fetal indication of CS in Atat hospital during the stud period

Table 3: Fetal indications of cesarean section in Attat Hospital, Gurage Zone, SNNPR, Ethiopia, July, 2014

Fetal indication	Frequency	Percentage out of fetal indications	Percentage out of total
Face presentation	2	0.7	2.2
Brow presentation	2	0.7	2.2
Malposition	4	1.4	4.4
Breech presentation	5	1.8	5.6
Umbilical cord prolapse	7	2.5	7.8
Transverse lie	7	2.5	7.8
Twin pregnancy	9	3.2	10
Macrosomia	19	6.8	21.1
Fetal distress	35	12.5	38.9
Total	90	32	100

There was one maternal death, 1(0.4%) and the overall maternal morbidity rate was 27(9.6%). Table 4: Shows post-operative maternal complications, the most common of which was respiratory tract infection 7(2.5%), followed by post op fever 6(2.1%). Mothers with ANC follow up were 4.15 times high to have good post-operative outcome than those who didn't have follow up (P-value<0.001, AOR=4.15, 95%CI =1.55,11.14) and those mothers whose pre operation hemoglobin ≥ 11 were 3.168 times high to have good post op outcome than mothers with pre operation hemoglobin <11 (P-value=0.038, COR=3.168, 95%CI=1.06,9.41).

Table 4: Binary logistic regression performed to show the association between dependent variables with maternal outcome in Attat Hospital, Gurage Zone, SNNPR, Ethiopia, July, 2014

<i>Variables</i>	<i>Maternal Outcomes</i>		<i>COR 95%CI</i>	<i>P-value</i>	<i>AOR 95%CI</i>	<i>P-value</i>
	GOOD	BAD				
ANC Follow Up						
Yes	232	17	6.2(2.5,15.2)**	0.000	4.15(1.55,11.14)*	0.005
No	22	10	1			
Labour duration						
<24Hr or not in labour	212	19	2.12(0.87,5.17)	0.097	1.2(0.41,3.46)	0.73
>24 hrs	42	8	1			
Type of anesthesia						
GA	46	10				
SPA	208	17	2.7(1.14,6.18)*	0.023	1.74(0.69,4.41)	0.238
Type of CS						
Primary	169	24	1			
Repeat	85	3	4.0(1.17,13.7)*	0.026	2.78(0.75,10.24)	0.12
Pre op HGB						
<11	17	5	1			
>11	237	22	3.16(1.06,9.4)*	0.038	2.2(0.63,7.82)	0.21

Table 5: Post-operative maternal complications of Cesarean section in Attat Hospital, Gurage Zone, SNNPR, Ethiopia, July 2014

S.No.	Complication	Frequency	Percentage
1	Respiratory tract infection	7	2.5
2	Post-operative fever	6	2.1
3	Endometritis	4	1.4
4	Wound infection	4	1.4
5	Urinary tract infection	3	1.1
6	Sepsis	1	0.4
7	Hemorrhage	1	0.4
8	Wound dehiscence	1	0.4
Total		27	9.7

Two hundred seventy four (97.5%) of the neonates were born with Apgar score of ≥ 7 at 5th minutes. Neonates delivered with good Apgar score (≥ 7) at 1st min have good outcome of survival as compared with those born with Apgar score < 7 at 1st min (P-value=0.001, AOR=169.2, 95% CI=8.2, 3504). Neonates delivered by mothers with ANC follow up have good post-operative outcome than infants delivered by mothers without ANC follow up (P-value=0.00, AOR= 77.7, 95% CI= 7.25, 831). Mothers in labor for less than 24hours duration have high Percentage of infants with good neonatal outcome (P-value= 0.083, COR=2.48, 95%CI=0.88, 6.98).

Neonates whose mothers were term have good chance of survival than whose mothers were preterm and postterm (P-Value=0.017,AOR=92.5,95%CI=2.2,3836.). The association was not statistically significant b/n fetal outcome and parity and gravidity during the study period.

One hundred forty eight (52.7%) of the neonates were male.

The gross perinatal mortality rate (PNMR) was 64/1000

Table 6: Binary logistic regression performed to show the association between dependent variables with fetal outcome in Attat Hospital, Gurage Zone, SNNPR, Ethiopia, July, 2014

<i>Variables</i>	<i>Fetal outcome</i>		<i>COR 95%CI</i>	<i>P-value</i>	<i>AOR 95%CI</i>	<i>P-value</i>
	Good	poor				
GA						
<37 weeks	19	9	0.603(0.10,3.50)	0.57	0.89(0.029,27.3)	0.947
37-42 weeks	237	7	9.67(1.69,55.22)*	0.011	92.5(2.2,3836)*	0.017
≥42weeks	7	2	1			
ANC follow up						
No	6	12	1			
Yes	243	20	24.3(8.24,71.6)**	0.000	77.7(7.25,831)**	0.000
Pre OP HGB						
<11	86	2	1			
≥11	177	16	5.56(1.77,17.44)*	0.003	1.91(0.23,15.5)	0.54
Duration of labor						
≥24hrs	44	6	1			
<24hr or not in labour	219	12	2.48(0.88,6.98)	0.083	2.91(0.366,23.13)	0.312
Type of Anesthesia						
GA	47	9	1			
SPA	216	9	4.59(1.73,12.2)*	0.002	0.5(0.08,3.099)	0.476
Apgar score at 1st min						
<7	83	16	1			
≥ 7	180	2	17.3(3.89,77.19)	0.000	169.2(8.2,3504)**	0.001

Table 7: Apgar score, fetal birth weight and sex distribution in Attat Hospital, Gurage Zone, SNNPR, Ethiopia, JULY, 2014

Variables	Category	frequency	Percentage
Apgar score at 1st min			
	≥7	182	64.8
	<7	99	35.2
	Total	281	100
Apgar score at 5th min			
	≥7	268	95.4
	<7	13	4.6
	Total	281	100
Birth weight in grams			
	<1500	1	0.4
	1500-2500	16	5.6
	2500-4000	238	84.6
	≥4000	26	9.3
	Total	281	100
Fetal Sex			
	Male	148	52.7
	Female	133	47.3
	Total	281	100

Unfavorable neonatal outcomes, 7(2.5%) still births and 10(3.6%) early neonatal deaths, were reported from cases with emergency C/D except 1(0.4) case reported from elective C/D. But the association was not statistically significant between type of C/s and neonatal outcome.

The cause of prenatal death was , birth asphyxia 6(2.1%),obstructed labour 4(1.4%),APH 4(1.4), and prematurity 4(1.4%).

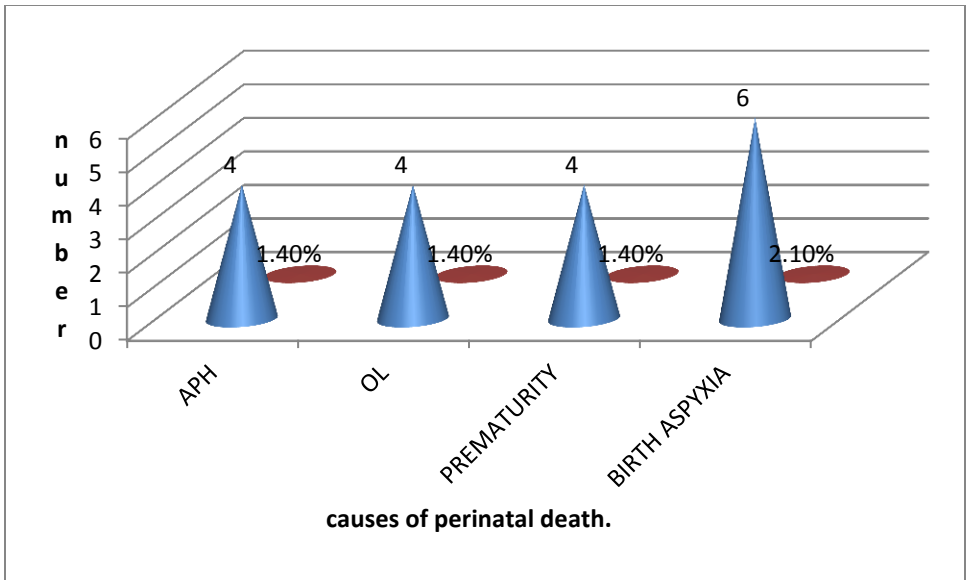


Figure 4: cause of prenatal death in Attat hospital during the stud period

CHAPTER SIX: DISCUSSION

The cesarean section rate of 27.6% in this study was approximately similar to 23.1% reported from Sagamu, Southern Nigeria, 24.1% reported from Pakistan and 27.1% from Brazil, developing countries like Ethiopia. But the figure is lower than the rate of cesarean section in Chile (40.5%) and most developed countries like USA 32% (13, 30, 34). This cesarean section rate was significantly higher as compared with cesarean section rates in other parts of the country like 10% in Tikur Anbessa Hospital, 8% in Jimma Hospital and 18% reported from the national review of cesarean delivery in Ethiopia but similar to 26.2% reported from another study in Ethiopia (7, 17, 18, and 22). This rate was above 15% recommended by the World Health Organization .

The frequency of cesarean section depends on the inherent characteristics of the obstetrics population, socio-demographic pattern, referral role of the hospital, departmental policies regarding management of cases of dystocia, breech, fetal distress, and previous cesarean section, physician factor and medico legal aspects, and consideration of maternal choice and wishes (30). The higher rate of cesarean section in this study might be because of use of electronic fetal heart rate monitoring devices, less time given for conservative management of fetal distress (intervention with a single episode of fetal distress), increased number of repeat cesarean section with limited number of VBAC, more than three scars were allowed without BTL and acceptance of mothers at risk referred mainly from health institution. Each case should be thoroughly evaluated to determine the possibility for vaginal delivery (35).

In this study, the CS rate of 31% in primigravidae is approximately similar to 25% reported from Tikur Anbessa Hospital, Ethiopia and 25% from Sagamu, Nigeria. This is an unacceptably high because of the implications of CS on the future reproductive carrier of these groups of the patients, especially in this environment large family size is desired (7, 30).

Similar to an earlier study from other parts of Ethiopia (Tikur Anbessa Hospital) and other developing countries (Ilorin, Nigeria) the majority of CS in this study (90.4%) were performed as an emergency. Surprisingly 88.6% of the patients had ANC follow up. One hundred ninety three

(68.7%) of the mothers had primary cesarean section which was similar to study done in Tikur Anbessa Hospital, Ethiopia (67.6%) (7,36).

The indications for cesarean section can be maternal or fetal. Maternal indications constituted 68% of the caesarean section in this review, the most common of which is cephalopelvic disproportion (38.1%) which is similar to the reports from other parts of the country (7, 18 ,36,37) and other developing countries (36, 37). Because nutritional factors have dominant influence on pelvic size and shape and malnutrition especially during childhood result in pelvic contraction and general growth stunting; this high incidence of cephalopelvic disproportion may be related to the malnutrition that is still rampant in developing countries including Ethiopia. Previous caesarean section was the other most common maternal indication (19. %)

Previous caesarean section was said to constitute the highest single indication for repeat section because obstetricians still regard vaginal birth after previous caesarean section as a high-risk option. Trial of labor under close monitoring in carefully selected patient is now increasingly being advocated and it is reported that 64.8-86.0% of patients with a caesarean section who were allowed for trial of labor delivered without any complication (30).

Fetal distress was the leading fetal indication and it accounted for 12.5% of all cesarean sections performed in this study. This was higher than 6% reported from Jimma Hospital, Ethiopia, (18,) and lower than 26.6% reported from a comparative study in Tikur Anbessa Hospital, Ethiopia (22). This variation might be attributed to less priority given for conservative management of fetal distress in Attat Hospital. This high value may be related to the use of intermittent auscultation, nature of amniotic fluid and use of electronic fetal heart rate monitoring as a means of fetal monitoring during labor in the study center, because there is no facility for fetal blood acid-base study. With this method, the diagnosis of fetal distress largely depends on clinical signs (fetal heart rate abnormalities, meconium staining of the liquor) which might be associated with incorrect diagnosis sometimes.

Even though the risk of maternal death after cesarean section is 5 times higher than normal vaginal delivery, there was only one death (0.4%) which is low ,compared to study done in tikur anbesa (1.6%).(22). But, the overall maternal morbidity rate was 27(9.7%) which is slightly

lower than 20% reported from Jimma Hospital, Ethiopia. Mothers with ANC follow up have good post-operative outcome as compared with ladies with no ANC follow up (P-value=0.000, COR=6.22, 95% CI= (2.5, 15.2) which is similar to other studies (18).

The most common post-operative complications were respiratory tract infection 7(2.5%) and post op fever 6(2.1%) which were also the leading complications reported from a study done in Sultan Qaboos University(36), Oman. The reduction of post-operative complication might be because of routine use of prophylactic antibiotics associated with clinically important reduction in post-partum febrile morbidity, wound infection and other serious infections. The patients with postpartum hemorrhage were successfully managed with uterotonics. And there was 4(1.4%) mothers transfused with cross-mated blood in this study which is relatively very much low when compared to study done in Tikur Anbesa (19%)(18). Low morbidity from anesthesia could be due to the use of spinal anesthesia for the majority of CS cases. Hypotension as a complication of spinal anesthesia was less likely because of the intraoperative management of cases with a potent vasoconstrictor (Ephedrine) and most cases with hemorrhage and low blood pressure were done under ketamine (36).The gross perinatal mortality rate (PNMR) Of 64/1000 live births was statistically higher than 2011 national report for all deliveries, which was 46/1000 live births. This figure is lower than 120/1000 live births reported from Jimma University, but similar to 62.4/1000 live births from Tikur Anbessa Hospital, Ethiopia (18, 22, 24). The common causes of perinatal mortality were, birth asphyxia (2.1%), APH (1.4) and prematurity (1.4%), obstructed labour (1.4) which are in similar with other studies (22).

CHAPTER SEVEN: CONCLUSION and RECOMMENDATION

7.1 Conclusion

Although the cesarean section rate of 27.6% observed in this review is above the 15% recommended by World Health Organization (WHO) for developing countries, the perinatal outcome is not improved. If unchecked, the rate might reach unacceptable levels. Cesarean sections performed for appropriate medical or obstetric indications are life saving for both the mother as well as the new born. But the high prevalence of C/S is not associated with improved perinatal outcome and it has risks for the mother and the neonate. Therefore to reduce the high prevalence of CS, each case should be thoroughly evaluated to determine the possibility for vaginal delivery. As a result, this study confirms that even though the cesarean is of the most commonly performed surgical procedures today; it is not without risks. Predictor variables like ANC follow up, GA, type of anesthesia; pre-operative HGB and first minutes Apgar of the neonates are strongly associated with maternal and fetal outcome.

7.2 Recommendation

Because the previous cesarean section was the major maternal indication, it is recommended that trial of vaginal birth after cesarean section should be encouraged in appropriate cases. In addition, for those cases with more than three scars, bilateral tubal ligation (BTL) should be done after appropriate counseling. Use of cardiotocography for continuous fetal heart rate monitoring in labor with confirmation of suspected fetal distress through fetal acid-base study is also recommended if resource is available. Furthermore, time has to be given for conservative management of fetal distress rather than rushing to operation theatre with a single episode of fetal heart rate abnormality. There is a need for a prospective study to evaluate the reasons for the increasing cesarean section rate in this Hospital.

Since cephalopelvic disproportion is the common indication associated with increased CS rate, the woreda, Zonal and National management bodies are responsible to prevent this problem through avoidance of malnutrition and poverty by enhancing food security. ANC follow up is also strongly recommended.

ANNEX 1

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ANNEX 2

CHECK LIST

Jimma university, collage of public health, faculty of medical science, coordinating office of integrated emergency obstetrics and surgery, questionnaire format on prevalence and outcome of caesarean section at ATAT Hospital, Ethiopia, Gurage Zone, SNNP, A retrospective three year study from January 2011 –december2013 G.C.

PART I: SOCIODEMOGRAPHIC INFORMATION

No.	Questions	Coding Categories	Code
1	Stated age in years	_____year	
2	Residence	urban rural	1 2
3	Marital status	Married single Divorced Widowed	1 2 3 4
4	Occupation	House wife Daily laborer Government worker Private instit. Worker Student Trader Other specify_____	1 2 3 4 5 6
5	Educational Status	Illiterate Primary school Secondary school College University	1 2 3 4 5

6	Religion	Muslim	1
		Orthodox	2
		Protestant	3
		Catholic	4
		Others specify_____	
7	Ethnicity	Amhara	1
		Tigre	2
		Oromo	3
		Gurage	4
		Others specify_____	
8	Monthly income in Birr		

PART II: OBSTETRIC HISTORY

No.	Questions	Coding Categories	Code
2.1	Gravidity	Primigravid	1
		multi	2
2.2	Parity	0	1
		1 -4	2
		>4	3
2.3	Did she remember her LNMP	Yes	1
		No	2
2.4	GA age in weeks	<37	1
		37-42	2
		>42	3
2.6	Did the mother have ANC follow up	Yes	1
		No	2
2.7	Duration labor in hours	<12hrs	1
		12-24hrs	2
		>24hrs	3
		Not in labour	

2.8	Primary cs	yes	1
		no	2
2.9	If answer for Q2.8 is yes	Elective	1
		Emergency	2
2.10	Repeat cs	yes	1
		no	2
2.11	Answer for Q 2.10 IS Yes	Electiive	1
		Emeregency	2
2.12	Type of Uterine Incision	LUSTCS	1
		Longitudinal	2
		Inverted T	3
		J shaped	4
2.13	Was BTL done during the procedure?	Yes	1
		No	2
2.14	HCT before operation	_____	
2.15	Type of anesthesia	General anesthesia	1
		Spinal anesthesia	2

PART III: INDICATIONS OF CESAREAN SECTION

No.	Questions	Coding Categories	Code
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3.1	Cs indications	CPD	1
		Previous CS	2
		Preeclampsia/eclampsia	3
		Failed Induction	4
		Failed Instrument	5
		Placenta Previa	6
		Abruptio placenta	7
		Obstructed labor	8
		Bad OB history	9
		Fistula repair	10
		Tumor Previa	11
		Poor progress of labor	12
		Prolonged PROM	13
		NRFHP	14
Other specify _____			

PART IV: OUTCOMES OF CESAREAN SECTION

No.	Questions	Coding Categories	Coding
4.1	Maternal outcome	Alive	1
		Death	2
4.2	What is her Hgb after procedure?		
4.3	Did she transfuse blood?	Yes	1
		No	2
4.4	If the answer for Q4.1 is 2 what was the cause of death?	Failure to control	1
		bleeding (hemorrhage)	2
		Eclampsia	3
		Sepsis	4
		Anaesthesia complication	5
	Others		

		specify: _____	
4.5	Fetal outcomes	Alive Still birth or Early neonatal death	1 2
4.5.1	If 2 for Q4.5 what was the cause of death?	Prolonged labor Obstructed labor Birth asphyxia APH Prematurity Others specify _____	1 2 3 4 5
4.5.2	Weight of the neonate	_____	
4.5.3	Fetal Sex	Male Female	1 2
4.5.4	APGAR score at 1 st & 5 th min.	_____	
4.6	Postoperative complication following CS	Post-operative fever Wound infection Sepsis Endometritis Hemorrhage Urinary tract infection Wound dehiscence DIC Respiratory tract infection Deep vein thrombosis Death	1 2 3 4 5 6 7 8 9 10 11

		NO complication	12
		Others	13
		specify: _____	

PART V: Total no. of deliveries in each year

5.1	Total no. of deliveries in each year	2011 _____	
		2012 _____	
		2013 _____	

Name of data collector _____

Signature of data collector _____

Date of data collection _____