



**ST. PAUL'S HOSPITAL MILLENNIUM
MEDICAL COLLEGE
DEPARTMENT OF PUBLIC HEALTH**

**ASSESSMENT OF THE RATE, MATERNAL AND FETAL
OUTCOMES OF BIRTH FOLLOWING CESAREAN SECTION AT
ABAALA HOSPITAL IN 2008 AND 2009 E.C**

BY: DR. AMAN ABDELLA (INTERM)

ADVISORS

DR. ELIAS SENBATO, (MD, PHD, ASS.PROF.)

DR. TADESE, (ASS.PROF. OF OBGYN,)

**A STUDENT RESEARCH PROJECT TO BE SUBMITTED TO THE
DEPARTMENT OF PUBLIC HEALTH, SPHMMC, IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF MEDICINE**

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ACRONYM & ABBREVIATION

SPHMMC: St. Paul's Hospital Millennium Medical College

CI: Confidence Interval

ANC: Anti Natal Care

MMR: Maternal Mortality Rate

FMOH: Federal Ministry of Health

WHO: World Health Organization

CS: Caesarean Section

ERC: Elective Repeat Caesarean

VBAC: vaginal birth after cesarean section

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Abstract

Background: *This study aims to comparing caesarean section rates, maternal and neonatal outcomes of Cesarean delivery .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 and developing countries. The global Cs rate is distributed very unevenly and results 15% of abdominal delivery. The four most common indications for cesarean delivery include: failure to progress during labor, previous caesarean section, no reassuring fetal status and fetal mal-presentation.*

Objective: *The study attempts to determine the prevalence, Outcomes and complications of cesarean section in Abaala Hospital, Ethiopia.*

Methodology: *Hospital based Cross-sectional retrospective study will conduct in ABAALA HOSPITAL, AFAR ETHIOPIA. Data will collect using structured questioners by trained data collectors. After data is collected, it will be entered into a computer and analyzed using SPSS version 21.0 statistical software. Multivariable logistic regression with 95% CI at $P \leq 0.05$ will be used to study the prevalence and outcome.*

Budget and Work plan: *Total cost of the research project is estimated to be 8,860.00 birr. Proposal work and field preparation will be completed till Feb 2018, data will be collected April –May 2018 and analysis, compilation and report write up will be April-june 2018*

Key words: *cesarean section, cross-sectional, antenatal care, anesthesia, neonate*

1. 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. The abdominal incision could be in the midline vertical below the umbilicus, infra-umbilical midline incision. It may be low transverse, slightly curve linear incision at the level of pubic hair line and extended somewhat beyond the lateral boarder of the rectus muscle (pfannenstiel).

Currently it is estimated about 20 million cesarean section (CS) deliveries occur each year in the world (1). This makes it the most frequent abdominal surgery performed in adults. The number of women having babies born by cesarean section is rapidly growing in a continuous way in both the developed and developing countries. This is happening in developed countries and in Latin America especially in Brazil. In United States approximately 1.2 million women had a cesarean birth representing 29.1% of all births and in the United Kingdom it was about 20%, Brazil has one of the highest rates of cesarean sections in the world, which reached a high peak of 36.4%. This is higher than the rate that expected by World Health Organization (1).

The World Health Organization states that the rate of cesarean section should be at maximum of 15% and no region in the world is justified with having a cesarean rate greater than 10% to 15% and not be less than 5%. The Increment associated with this surgical procedure is that rapid decrease in both mortality and morbidity of fetus and mothers who undergone Cesarean sections. For example, in the early 1990s maternal mortality after Cesarean section was estimated to be below 1 per 1000 and this increase in safety encouraged obstetricians to find more and more reasons for carrying out this operation. (1, 2)

However, there are still complications associated with this procedure. Maternal morbidity associated with C-section is five to ten times greater than that associated with vaginal delivery. So, if the rate of C-section which is higher the recommended of WHO it will have negative effect on both maternal and fetus health worldwide.

In addition maternal & neonatal morbidity and mortality in developing countries especially in Sub-Saharan country are very high. In most of sub-Saharan Africa, rates of caesarean sections are low. In West Africa where they account for less than 1% of expected births this means that doctors might not be as proficient in medical procedures, resulting in substandard care and sometimes death of the mother(5). In most of countries in sub-Saharan Africa there are surgical services available in referral facilities, but the resources are limited, quality of care is heterogeneous, and distance to the facility is frequently a real barrier for people living in rural regions and maternal morbidity and mortality remain very high.

According to 2011 Ethiopian demographic and health survey report, 2% of the pregnant women are delivered with cesarean section which is increased by 1% from the 2010 Demographic and health survey(4). The Cs rate in some specified hospitals of the country such as Black Lion Teaching Hospital's around 10% in 1992. (4) 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 obstetrics procedure, knowing the prevalence and pregnancy outcomes of operative delivery particularly Cs is crucial. 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 comprehensive obstetric care in health institutions, in doing so cesarean section should be performed in those health institutions for scientific reasons based on the WHO recommendation. Additionally cesarean section should improve and contribute in the reduction of maternal & neonatal morbidity and mortality of the hospital as well as the country. Abaala Hospital provides obstetric services including Cesarean section to the community of Kilbati zone and neighboring woreda and there is no research done on caesarean section at the hospital yet.

1.2. Statement of the problem

Pregnancy and parturition are events of considerable significance in the life cycle of women. Though cesarean section is considered as a life-saving intervention for both the maternal and a child health, the quality of obstetric care further determines the outcomes of the mother as well as the fetus. Cesarean section unless used appropriately, the potential risk to the mother and baby becomes more than the vaginal delivery, therefore it can be considered as the vital indications of the

health status of the neonate and the mother. Poor outcomes of cesarean section among mothers and fetus in developed and developing countries were reported consistently higher compared to vaginal deliveries. Unlike developed countries, most cesarean section deliveries in developing countries are conducted because of obstetrical complications or medical illness. Consequently, the risk of cesarean section may be worsening if it is performed under emergency situations

In Ethiopia, maternal and neonatal morbidity and mortality rate is high. Maternal and neonatal death in the country is reported as 470 per 100,000 live birth and 37 per live births respectively. Though, institutional Delivery rate across the country become increasing, the change in reducing maternal and neonatal mortality rate is not reduced substantially. According to 2011 Ethiopian demographic and health survey report, 2% of the pregnant women are delivered with cesarean section which is increased by 1% from the 2010 Demographic and health survey report. Therefore, this study want to assess the cesarean section rate, outcomes of cesarean section on the mother and fetus in Abaala hospital

1.3. Justification of study

This study is aimed to providing information on the prevalence, and outcomes of CD in Abaala 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 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 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 (NGO's) working in this line. The best practices in the Hospital may also help other researchers, Zonal health departments, afar region and the country at large.

2. LITERATURE REVIEW

WORLD WIDE

The World Health Organization (WHO) puts the acceptable rate of C/S to be between 10% and 15% of all births in developed countries. However, access to safe Caesarean section in resource-limited settings is much lower, estimated at 1–2% reported in sub-Saharan Africa. In 2015 a worldwide population-based ecological study with longitudinal data found that the rates of caesarean section have increased in most countries in the world over the last 12 years. (1) More developed countries had higher baselines and greater increases in caesarean section rates than least and less developed countries in absolute terms; however, maternal and neonatal mortality rates in these countries changed only slightly during the corresponding period. On the other hand, the least developed countries showed the most relative increase in caesarean section rates. There was a substantial decrease in maternal and neonatal mortality with a small absolute increase of caesarean section rates in the least developed countries. The significant and negative relationship between caesarean section rates and mortality was only found when the caesarean section rate was below 5–10%. I.e. the crude association appears to be mainly explained by socio-economic conditions. In addition, there analysis suggests that a caesarean section rate higher than around 10% at a population level may not be significantly correlated with maternal and neonatal mortality Over the past three decades the WHO-proposed caesarean section rate of 10–15% was used as a threshold, despite the lack of concrete evidence to support this statement. (1)

Several ecological studies have analyzed the association between the mode of delivery and maternal, neonatal, and infant mortality, and identified an inflection point below which there was a strong association between caesarean section rates and mortality outcomes. A systematic review of ecological studies concluded that this point ranged from 9 to 16%, and at caesarean section rates above this threshold, there was no longer an association between caesarean section rates and maternal or infant mortality. Among the eight studies found, only two previous ecological studies controlled for socio-economic conditions. One of them found a negative association between caesarean section rates and maternal mortality, even after adjusting for gross national income, proportion of deliveries with skilled attendance, and proportion of literate population in Low-income countries. (1, 12)

Retrospective study to be obtained an estimate of C/S rates indications and consequences at teaching hospital in India in 1993- 1994 and 1998-1999 indicates the overall rate C/S increased from 21.8% in 1993-1994 to 25.4% in 1998-1999 among the 7,017 C/S cases 42.4% were prim gravida. Major indications for C/S include dystocia (37.5%), foetal distress with or without meconium aspiration (20.4%), repeated C/S (29%), and mal-presentation (14.5%). Maternal prenatal mortality was 299/10,000 and 493/1000 deliveries respectively and is high in spite of the increasing in C/S rate.(3)

AFRICA

Medicines sans Frontieres (MSF), a humanitarian medical organization, supports emergency obstetrical programs in the Democratic Republic of Congo (DRC), Burundi, and Sierra Leone where maternal mortality ratios are extremely high, exceeding 500 deaths per 100,000 live births, compared to 9 per 100,000 live births in resource-rich countries.(5)

A retrospective analysis of 3231 cases of C/S between 1994 and 1997 in morocco to assess the maternal mortality and morbidity associated with this intervention indicated the frequency to be 12.4%. The postoperative complication were primarily major hemorrhage (39 cases; 1.2%), fever (30 cases, 0.9%) and visceral lesion such as bladder rupture (3 cases; 0.1%). However, maternal mortality and morbidity rates are higher with C/S than with vaginal delivery.(8)

According to American College of Obstetricians and gynecologists opinion, Vaginal Birth after Caesarean Section (VBAC) is safer than repeated C/S delivery. Women with previous lower segment uterine Caesarean Section (LSCS) are strongly encouraged to try to deliver vaginally and trial of scar has to be given for those who don't have clear medical or obstetrical complication on previous C/S. Up to 80% of women with one C/S will be able to have VBAC. They strongly encourage women with a lower uterine incision to deliver vaginally, which is called "Trial of Scar".(10)

ETHIOPIAN SITUATION

There is one recent report from Attat hospital Gurage zone indicates 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. This rate was above 15% recommended by the World Health Organization. (2) 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. 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 and other developing countries.(2)

study conducted in Jimma Hospital from 23rd June 1992 to 24th September 1993 were suggested that out of 1236 deliveries, 100 mothers were delivered by caesarean section; giving a caesarean birth rate of 8%. The leading indications for caesarean section were Cephalo-pelvic disproportion (44%), mal-presentation and mal-positions (21%), repeat caesarean section (16%), antepartum haemorrhage (8%) and foetal distress (6%), accounting for 95% of the indications for caesarean section a five year period retrospective study (September 1987 to August 1992), among 11,657 consecutive deliveries at Yekatit 12 Hospital, Addis Abeba, Ethiopia, there were 645 CSs, an overall CS rate of 5.5%. During this study, the indications for CS were cephalopelvic disproportion (31.2%), foetal distress (21.4%), previous CS (17.5%), placenta praevia (6.6%), cord prolapse (4.2%) and others (19.1%). There were 99 perinatal deaths, a gross perinatal mortality rate of 153.5 per 1,000 live births, which was a significantly higher rate than the total rate for all deliveries (67.5 per 1,000 live births, $p < 0.01$). There were seven maternal deaths (case fatality rate of 1.1%). (7)

Prospective hospital-based study at Tikur Anbessa Teaching Hospital (TATH) between July 1991 and July 1992. Out of a total of 3237 deliveries conducted during the study period, 318(10%) were caesarean section. The leading or the major indication for abdominal deliveries were: repeat caesarean section, 103(32.4%), cephalo-pelvic disproportion, 93(29.2%), placenta Previa and

abruption-placentae 40(12.6%). Age ranged from 15-40 years, 58(18.2%) were women under the age of 20, and 182(57%) were between 20 and 30 years of 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 antenatal care in any health institutions. Two hundred and fifteen (67.6%) of the mothers had primary caesarean section. The chance of repeat caesarean section was statistically significant ($P < 0.001$). Fifty seven (18%) had elective caesarean section and 261 (82%) were emergency caesarean section. On eight (2.5%) of the patient, obstetric hysterectomy was performed. (4)

3. Objectives of the Study

3.1. General objective

- To assess the Rate, Maternal and Fetal Outcome of Birth Following Cesarean Section at ABAALA HOSPITAL

3.2. Specific objectives

- To determine the Rate of Cesarean Section at ABAALA HOSPITAL
- To assess Maternal Outcome Following Cesarean Section at ABAALA HOSPITAL
- To find out Fetal Outcome Following Cesarean Section at ABAALA HOSPITAL

4. Methods and Materials

4.1. Study area

The study will conduct at Abaala hospital in Abaala town. Abaala is located 823 km north east of Addis Ababa and 45 km from Mekelle city in the northern region of Ethiopia. The service has been operative since 2014. The Hospital has 7 beds. 3 Labor Beds and 2 Delivery Bed 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. Maternity I services are the main surgical procedures done. Elective and emergency surgical services are performed.

4.2. Study design

Hospital based cross-sectional retrospective study will used to study the prevalence of CD and its outcome at Abaala hospital

4.3. Source Population

All mothers had deliver at Abaala hospital in 2008 and 2009 E.C

4.4. Study population with eligibility criteria

4.4.1. Study Population

All mothers had cesarean section at Abaala hospital with all indication from September 1, 2008 up to Aug. 30, 2009 E.C

4.4.2. Inclusion criteria

All cesarean deliveries performed after period of viability (28 Weeks) including elective, emergency, primary and repeat cases are included in the study.

4.4.3. Exclusion criteria

Cesarean deliveries which lack full information excluded.

4.5. Sample Size

Sample size is calculated by the formula

$$n = \frac{(Z_{\alpha/2})^2 \times P \times (1-P)}{d^2}$$

d²

Where $Z_{\alpha/2} = 1.96$

Z= standard normal variable at 95% confidence level (1.96)

p= expected prevalence of cesarean section from similar study (at Finoteselam Hospital) is 11%

d= the desired precision of the estimate (5%)

n= the total sample size, with which sample size (n) become = 150

4.6. Study Variables

4.6.1. Independent variable

- Age
- Marital status
- Residency
- LNMP
- ANC follow up
- Parity
- Gestational age
- Type Anesthesia

- Duration of labor
- Pre-op hg

4.6.2. Dependent Variables

Rate of caesarean section

4.7. Data collection tool and procedure

Data will collect using pre-tested structured questionnaire using chart review method. The questionnaire consists of socio-demographic variables, obstetric history and outcomes of cesarean section. Mothers' information including age, parity, gestational age, antenatal care, duration of labor at admission, fetal condition at admission, onset of labor, spontaneous or induced, Information will obtain from theatre records, labor ward records, three nurses as data collector and one health officers as supervisors are recruit for the study. Two days intensive training regarding the objective of the study, confidentiality of information, and techniques to conduct review will give to data collectors and supervisor. To address the ethical issues, the data collector's will recruit among the permanent employees of the respective hospitals

4.8. Operational Definition/standandard Definition/

Cesarean delivery is defined as the birth of a fetus, placenta & membranes through incisions in the abdominal wall (laparotomy) and the uterine wall (hysterectomy) after 28 weeks of pregnancy

Cesarean hysterectomy refers to the removal of the uterus at the time of a planned or unplanned cesarean delivery.

Mothers are said to have **antenatal care** if they have visited health institution at least once.

A client with at least one previous delivery which is past 28 completed weeks of pregnancy is classified as **Multigravida and grand multipara** when the number of previous similar deliveries was at least five.

4.9. Data Quality and clearance

In ensuring the quality of data, all the data for each charts will be checked for completeness, accuracy, and clarity by the principal investigators and the supervisor, immediately after data collected

4.10. Data Analysis

After data collection completed, the data will entered into SPSS software version 21. Frequencies and graphs will used to describe some variables. And bivariate analysis will be used to examine association between dependent and independent variables. *Multivariable logistic regression with 95% CI and p-value of <0.05* were considered to be statistically significant.

4.9. Ethical consideration

Official letter of approval will obtain from from Abaala woreda health bureau to hospital administrative bodies, the purpose of the study will explain and permission letter will be given. The data will be collected from patients' charts after tracing by patient's number. Data will be collected by nurses and health officers.

5: Research Project Management

5.1 WORK PLAN

The various components of this research proposal and the time it will take are summarized in the following table.

Table 1: Time schedule

No	Activities	2018						
		Jan	Feb	Mar	Apr	May	JUN	JULY
1	Proposal development	X	X					
2	Approval of proposal ethical clearance		X					
3	Pretest			X				
4	Data collection analysis and report write up				X	X		
5	First draft report submission						X	

6	Review and research report finalization							X
7	Final research report submission							X
8	Research report evaluation by the examiners							X
9	Defense							X
10	Final report/ thesis submission after defense							X

5.2 BUDGET PROPOSAL

Table 2: Personnel Costs break down:-

Personnel	Activity	Quality	No	Working days	Per-time/day	Total
Data collectors	Training+ Data collection	nurses	3	5	40	300
Facilitator	Coordinating		1	10	60	200
Principal investigator	While organization		1	30	80	500
Data clerk	Data entry & clearance	IT qualified	1	contract	600	600
Total						1600

TABLE 3: TRANSPORT AND COMMUNICATION COST:-

Description	Trip	Freq.	Unit price	total
Fuel for car	For local transport	-----	-----	200
Communication (fax, tel. e-mail)	-----	-----	-----	200

Total	-----	-----	-----	400
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TABLE 4 : COST OF SUPPLIES (STATIONARY)

Description	Unit	Quantity	Unit price in Birr	Total in Birr
Duplicating paper	Rim	13	100	130
Duplicating ink	Tube	2	60	120
CD/R	single	5	30	150
Stencils	Each	1	90	90
Pens	Each	12	5	60
Pencils	Each	13	1	13
Photo copy	Each	--	154	154
Notebook	Each	12	10	120
Calculator	Each	1	80	80
Marker	Set	1	50	50
Total	----	-----	-----	1305

TABLE 5: PROJECT COST SUMMARY:-

Number	Descriptive cost	Total
1	Personnel	1600
2	Supplies	1305
3	Transportation and communication	400
4	Total	3305
5	Contingency (5%)	355
6	Grand total	3685

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7 QUESTIONNAIRE

1. SOCIODEMOGRAPHIC FACTOR

101. MATERNAL AGA

A <19 B 19-34 C >35

102. RESIDENCY

A URBAN B RULAR

103. MARITAL STATUS

A MARRIED B SINGLE

2. PREGNANCY CONDITION

201. PARITY

A, PG (1) B, MULTI (1-5) C, GRAND MULTI >5

202. GESTATIONL AGE BY WEEK

A. <37 B. 37-40 C. >40

203. LNMP

A. YES B. NO

204. ANC FOLLOW UP

A. YES B. NO

3. CURRENT OBSTETRIC HISTORY

301. TYPE OF CS

A, ELECTIVE B, EMERGENCY C, PRIMARY D, REPEAT

302 PREOP HG

A, 7-11 B, >11

303. TYPE OF ANESTHESIA

A, SPINAL ANSTHSIA B, GENERAL ANSTHSIA

404. DURATION OF LABOR

A, <12HR B, 12HR-24HR C, >24HR

405. INDICATION FOR CESAREAN SECTION

A, NRFHBP B, CPD C, MALPRESENTATION D,
OBSTRUCTED LABOR E, FAILED INDUCTION
E, OTHER

406. IS THERE MATERNAL COMPLICATION

A, YES B, NO

407. IF YES TO Q NO 6 WHAT TYPE

A, PPH B, WOUND INFECTION
C, ANESTHSIA COMPLICATION D, PUERPERAL SEPSIS E, OTHER

408. MATERNAL DEATH

A, YES B, NO

409. IF YES TO Q NO 8 WHAT WAS THE COUSE

A. HEMORRHAGIC SHOCK B. RESPIRATORY DISTRESS
C. SEPSIS D. ANESTHSIA COMPLICATION

FETAL OBSTETRICS RELATED VARIABLES

501. FETAL HEART BEAT AT ARRIVAL

A, POSITIVE B, NEGATIVE

502. PRESENTATION

A, CEPHALIC B, BREECH C, TRANSVERSE D, OBLIQUE

503. APGAR SCORE

A, VERY LOW (1-3) B, LOW (4-6) C, NORMAL >7

504 BIRTH WEIGHT IN GRAM

A, <2500 B, 2500-4000 C, >4000

505. IS THERE DIED NEONATAL

A, YES B, NO

506, IF YES TO Q NO 5 WHAT WAS THE COUSE

A, NEONATAL ASPHEXIA B, NEONATAL SEPSIS
C, RDS D, JAUNDICE E, OTHER.....

507, STILL BIRTH

A, YES B, NO

