PATTERNS AND OUTCOME OF OPERATIVE DELIVERIES IN NEKEMTE REFERRAL HOSPITAL NEKEMTE TOWN, EAST WOLLEGA ZONE, OROMIA REGION, ETHIOPIA.

BY

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ABSTRACT

Background*: The expectation of every pregnant woman is to undergo a spontaneous vaginal delivery with minimal or no resort to operative procedures at the end of pregnancy. For the majority of women this expectation becomes a reality. For some however, assistance is required either in the form of caesarean section or operative vaginal procedures in order to avert adverse maternal and fetal outcome . However there is no information on the pattern and outcome of operative deliveries in the study area. Thus, this study is aimed to fill the paucity of information in the study area that play vital role to reduce maternal and neonatal morbidity and mortality.*

Objective*: the objective of this study is to assess pattern and outcome of operative deliveries among mothers who give birth in Nekemt Referral Hospital from December 1/2012-April 30/2013.*

Methods: *A hospital based prospective cross-sectional study was conducted on 384 mothers who had operative deliveries at Nekemt Referral Hospital from December 1/2012-April 30/2013GC. The data were collected by trained data collectors using structured interview questionnaire and medical records review format. The data were cleaned, entered, processed and analyzed using SPSS for windows version 16.0. Statistical test for significance was employed where appropriate at the level of significance of 5%.*

Result : *The prevalence of operative deliveries was 33.1% and the rate of operative vaginal delivery and cesarean section were 71 (18.5%) and 279 (72.5%) respectively . The major indications of cesarean section were obstructed labour 58 (20.7%), fetal distress (NRFHRP) 47(17.9%) and CPD 40 (14.3%). The commonest cause for instrumental vaginal delivery was fetal distress (NRFHRP) 33 (57.9) followed by prolonged second stage of labour 23 (40.3%). With regard to maternal and fetal outcome, about 53(13.8%) mothers had complication including maternal death after operative deliveries within the first 24 hours and 162(41.9%) had bad neonatal outcome.*

Conclusion and recommendation*: Parity ,ANC and type of operative delivery are significant factors associated with maternal and neonatal outcome. Special attention should be given to laboring mothers with grand multiparty parity and non ANC attendants to minimize the possible post operative complications by health care providers in Nekemet Referral Hospital. Furthermore; the federal ministry of health in collaboration with Oromiya Health bureau should encourage the primary health care provider to carry out expensive community based mobilization on birth spacing and standard ANC utilization.*

Key words*: Operative delivery, caesarean section, obstructed labour and outcome.*

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ABBREVIATIONS

APH	Ante-partum hemorrhage
ANC	Antenatal care
CSR	Cesarean section rate
C/S	Cesarean section
CPD	Cephalopelvic disproportion
GA	Gestational age
IVD	Instrumental vaginal delivery
JUSH	Jimma University specialized hospital
LUSTCS	Lower uterine segment cesarean section
LBW	Lower birth weight
NRFHRP	Non reassuring fetal heart rate pattern
PPH	Postpartum hemorrhage
VVF	Viseo-vaginal fistula
WHO	World health organization

CHAPTER ONE - INTRODUCTION

1.1.BACKGROUND

The expectation of every pregnant woman is to undergo a spontaneous vaginal delivery and minimal or no resort to operative procedures at the end of pregnancy. For the majority of women, this expectation becomes a reality. For some however, assistance is required either in the form of caesarean section or operative vaginal procedures in order to avert adverse material and fetal outcome. Assisting laboring women to deliver vaginally using specialized instrument is a practice that dates back several centuries. Forceps and venous are the most popular of the operative vaginal procedures with comprehensive documentation of their development and use in the lay and medical media . Procedures like symphysiotomy and destructive operations to remove a dead fetus are probably now materials for the waste bins of medical history. However, some still argue for a place for them in modern obstetric practices especially in low income countries where the indication for their use till be found (1).

Operative delivery is defined as any procedure undertaken to facilitate the delivery of the fetus. The success of such a procedure depends on the skill and or the experience of the operator. The timing of such an intervention must be in the interest of both the mother and the baby (2).

Operative delivery can be divided in to operative vaginal delivery and abdominal delivery. Operative vaginal deliveries are accomplished by applying direct traction on the fetal skull with forceps or by applying traction to the fetal scalp by means of a vacuum extractor. The indication for operative vaginal delivery performed with either the vacuum extractor or forceps are the same. The frequency of operative vaginal deliveries is estimated to be 10% of all vaginal deliveries. Most of these are vacuum deliveries with forceps deliveries comprising less than 3% of total deliveries (3).

Instrumental vaginal delivery is a key element of essential obstetric care ,scaling up its use in resource poor countries through training and supply of appropriate equipment is likely to contribute significantly to reduced maternal and new born morbidity or mortality(1)

Cesarean delivery has played a major role in lowering both maternal and perinatal morbidity and mortality rates during the past century .The initial purpose of the operation was to preserve the life of the mother with obstructed labor but the indications expanded over the years to include delivery for a variety of more subtle dangerous to the mother or fetus . Contributing to its more frequent use is increased safety that is largely due to better surgical technique, improved anesthesia, effective antibiotics and availability of blood transfusion (3). Thus the purpose of this study is to assess pattern and out-come of operative deliveries in Nekemt referral hospital.

1.2 STATEMENT OF THE PROBLEM

One of the areas of obstetrics that has dramatically changed in the past several years is operative vaginal delivery. In 1970 the operative vaginal delivery rate in the United States was approximately 30%. By 1997 this rate had decreased to less than 10%. The most current statistics show the operative vaginal delivery rate to be approximately 6%. At the same time the number of forceps- assisted vaginal deliveries has decreased, while vaginal deliveries using the vacuum extractor have increased as a proportion of operative deliveries(4).

Maternal and neonatal complications after forceps applications include lacerations of the vaginal and cervix, Pelvic hematomas, urethral and bladder injuries, uterine rupture, minor fetal facial lacerations, forceps marks, facial and brachial plexus palsies, cephalhematomas , skull fractures and intracranial hemorrhage (5,6).

Instrumental vaginal delivery is currently widely used among obstetrical practices and leads to significant decrease in fetal mortality and morbidity. However, these practices could be associated with several neonatal adverse effects. Neonatal mortality is not changed by forceps or vacuum use if no other risk factors are associated. The main neonatal adverse outcomes described with both techniques are extra and intracranial hemorrhages usually, intra-cerebral hemorrhages have good neurological prognosis. Other traumatic complications observed when using forceps (facial nerve palsy, cranial bone fracture) are not associated with long term functional consequences .Many of the most severe neonatal complications are observed when perinatal asphyxia has occurred. Extractor types and quality of use under defined criteria are closely associated with neonatal adverse outcomes in operative vaginal delivery. Forceps deliveries are as safe as vacuum deliveries to the neonate(8).

Destructive operations are a procedure to reduce the bulk of the fetus in order to permit easy passage through the parturient canal. These are virtually obsolete and almost never done in the developed countries now a day. But it may be an essential part of obstetric practice in some developing countries. Destructive procedures include craniotomy (perforation of the skull and evacuation of brain tissue), decapitation (severing of the fetal head from the trunk), cleidotom (division of the clavicle) and evisceration (incision of the abdomen and/or thorax to evacuate its viscera). These procedures complicate with tear or laceration of the vagina, cervix and lower segment of the uterus. Common indications of these procedures include: - hydrocephalus, retained after-coming head of a dead fetus, CPD with a dead fetus and obstructed labor(8, 10).

Abdominal delivery is a surgical procedure that involves the delivery of the fetus through an abdominal incision. Cesarean sections account for about 1/5 of all births in the US. Indications include: fetal distress, CPD, APH, footling breech baby, active genital herpes, previous cesarean deliveries and obstructed labour(11).

Cesarean delivery is an operative procedure to deliver a viable fetus (i. e after 28 weeks or 20 weeks according to the ACOG) through abdominal and uterine incisions. 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 to day. 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 (12).

Cesarean section rates are rising. Unnecessary cesarean section confers an increase in maternal mortality and morbidity as well as having considerable financial implications. Cesarean section is usually justified by the assumed benefit for the fetus. The changing trends in the rates of cesarean section for various indications may be explained partly by improved anesthetic and neonatal techniques. Cultural changes and expectations in the general population and obstetricians' fear of litigation may have made the changing rate and indications for cesarean section seem more acceptable. The obstetrician is under an obligation to share the evidence that cesarean section is the optimum made of delivery with the pregnant woman and her birth attendants to allow the woman to make wise decision about her management (17).

Cesarean hysterectomy is a hysterectomy which is carried out after cesarean section in the same sitting for one of the following reasons: uncontrollable PPH, unrepairable rupture uterus, operable cervical cancer, couvelaire uterus (bleeding through the myometrium due to abraptio placenta), placenta accrete and severe uterine infection. Despite improvement in medical and surgical techniques, complications are not unusual in cesarean section, in some cases it may be life-threatening. Complications affecting the mother can be divided schematically in to 3 groups: immediate surgical complications essentially represented by hemorrhage usually involving local factors (tearing of lower segment, placenta ion disorder) and anesthetic complications. Complications affecting the fetus are much rarer and are generally linked to the indication of cesarean section rather than to the section itself. Nevertheless, fetal morbidity can be affected by cesarean section: transient respiratory distress, retention of anesthetic and even some traumas have been noted during fetal delivery (21).

The extent of operative deliveries and its outcome in the current study area is not known, thus this study is aimed at providing information on pattern and outcome of operative deliveries within the study area which will play vital role to reduce maternal and neonatal morbidity & mortality.

CHAPTER- TWO

2.1 LITERATUR REVIEW

The total rate of operative vaginal delivery in 2004 for which complete data were available was only 5.2% in the United States. Obstetric forceps were used in 1.1% of deliveries and 4.1% were delivered via the vacuum extractor. Since 1989, there has been an 80% decrease in the frequency of operative forceps use, steadily falling over 15 years from 5.5% in 1989 to 1.1% in 2004. During this time, the frequency of vacuum extractor procedures peaked in 1997 at 6.2% thereafter decreasing by one third to a level of 4.1% in 2004 (5).

From 1970 to 2005, the cesarean delivery rate in the United States increased from 5% to 30%. The four primary indications for cesarean delivery include dystocia, elective repeat cesarean delivery, fetal distress and abnormal fetal presentation. Dystocia translated means difficult of birth and includes all abnormalities that may occur in women during labor (7).

Repeat cesarean deliveries and those performed for dystocia have been the leading indication in both the United States and other western industrialized countries. Although it is not possible to catalog comprehensively all appropriate indications for cesarean deliveries, over 85% are performed because of prior cesarean deliveries, dystocia , fetal distress , or breech presentation (8).

The most common indication of cesarean delivery during 1990 in four different countries in USA previous cesarean ,dystocia ,breech ,account 8.5 ,7.1 and 2.6% respectively and in Norway dystocia ,breech and fetal distress account 3.6 ,2.1 and 2.0% respectively and overall cesarean rate in USA 23.6% and in Norway 12.8%. (8).

A study on cesarean section rate and trends in indication for cesarean delivery at the Singapore general hospital during two study periods of six months each (first six months 1998 and the last six months of 2001) indicate in the first six months of 1998,170 cesarean section were performed giving a rate of 16.77%, 54.12% of women were multiparous. The main indications for cesarean section was dystocia (4.24% of deliveries) 260 cesarean section were performed in the later held of 2001 giving a cesarean section rate of 25.10% .Fifty three percent of women were mutiparous. The main indication for cesarean section was dystocia(5.4%)of deliveries .Increase in cesarean section rate in 2001 was attributated to statistically significance rise in cesarean section for previous cesarean section and placenta previa major (8).

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%). An absolute indication for a cesarean delivery is a previous incision through the myometrium of the uterus. This occurs in all classical

cesarean deliveries and some myomectomy surgeries. All pregnancies complicated by placenta previa should be delivered by cesarean (11).

The most common cause of obstructed labour was cephalopelvic disproportion (64.9%) followed by mal position mal presentation (32.5%). Cesarean section was performed in 88 of the 195 (46.1%) obstructed labour cases, craniotomy in 31(16.2%), instrumental delivery in 27 (14.1%) and repair of ruptured uterus in 17(8.9). Maternal and neonatal fatality rates were 3.7% and 55.5%, respectively. Serious complication increased with parity (14).

A review of all cases of cesarean section that were done in the maternity unit at Usmanu Danfodiyo University Teaching Hospital ,Sokoto, Nigeria, between January 2006 and April 2007,with emphasis on indications and perinatal outcome. The main indications for cesarean section were cephalopelvic disproportion 86(39.8%), previous section plus an obstetric abnormality 39(18.1%) and prolonged obstructed labor (10.2%). The indication with the poorest fetal outcome was prolonged obstructed labor (16).

Retrospective study to describe and compare the clinical indications of primary and repeat cesarean sections done at the Princess Badeea Teaching Hospital in North Jordan done between 1 January and 26 November 1998 (n=740), showed that cesarean rate during the study period was 8.8%; 22.7% of these were repeat procedures (n=168). Elective cesarean delivery was the leading cause of repeat sections, followed by dystocia, others, breech and fetal distress. In contrast, breech presentation, dystocia and fetal distress were the leading indications for primary cesarean section (19).

A retrospective and comparative study of women delivered by cesarean section over two different 3-years periods was conducted at Olabisi Onabanjo University Teaching Hospital, Sagamu, Nigeria. The cesarean section rate (CSR) increased from 10.3% in 1989-1991 to 23.1% in 2000-2003. The most frequent indication in both periods was different: prolonged/obstructed labour (20.0%) in 1989-1991 and ante partum hemorrhage (14.9%) in 2000-2003. Mal presentation, ante partum hemorrhage and pre-eclampsia/eclampsia were responsible for 51.7% of the difference in the CSR recorded between both periods. The CSR rose from 13.3% to 25.0% while the instrumental vaginal delivery (IVD) rate decreased significantly by 11.4% among the nulliparous women between the periods increase in CSR can be attributed mainly to reduction in IVD rate and alteration in the management of labour complications (22).

Hospital-based study was done at Tikur Anbessa Teaching Hospital between July 1991 and July 1992 and total of 3237 deliveries conducted during the study period, 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 abruption-placenta 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 periods to bear children. Eighty one (25%) of the mothers were primiparae. 158(50%) were between para one and para four , 79(25%)were grand multiparea . 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 cesarean section. Fifty seven (18%) had elective cesarean section and 261(82%) were emergency cesarean section .On eight (2.5%) of the patient, obstetric hysterectomy was performed. There were five maternal deaths among the cesarean section cases. The main cause of maternal death was failure to control bleeding during the cesarean section . There were preventable deaths in experienced hands. There were nine (2.8%) still births and 15(4.7%) early neonatal deaths. The mean birth weight among booked cesarean section was 3108 grams and un booked cesarean section were 2991grams (24).

Prospective study done 100 mothers who underwent cesarean section in Jimma Hospital between June 23, 1992 and September 24, 1993 were analyzed to determine the incidence, indicators and postoperative complications of cesarean delivery. During the study period there were 1236 deliveries of which 100were cesarean deliveries giving the cesarean birth rate of 8%. The leading indication for cesarean section were cephalopelvic disproportion (44%) , malpresentations and mal positions (21%) repeat cesarean section (16%) antepartum hemorrhage (8%) and fetal distress (6%), accounting for 95% of the indications of cesarean section .There were no maternal deaths, but the overall morbidity rate was 20% . The causes of morbidity were wound infection (27.1%), sepsis (21.4%) endometritis(33.3%) and hemorrhage (8%) . The single most important causes of perinatal death was prolonged and obstructed labor (25).

2.2 SIGNIFICANCE OF THE STUDY

Despite the increase number of candidates for operative deliveries in Ethiopia, much remained to be done on pattern and outcome of immediate post operative deliveries. Even though some steadies had been carried out about indication and outcome of immediate post operative deliveries, there is no report on Nekemte referral hospital recently. Thus, this study was aimed to determine pattern and outcome of immediate post operative deliveries in Nekemte referrel hospital which can be helpful for governmental, nongovernmental, the hospital administrators and professionals working on mother and child related issue to consider the outcome of the study during their planning and provision of obstetric care . Furthermore , the findings can also be used for researchers on further study.

2.3 conceptual frame work

This conceptual framework is developed based on review of different literatures and text books. The arrows in the framework indicate the direct effect of the boxed factors on the outcome.

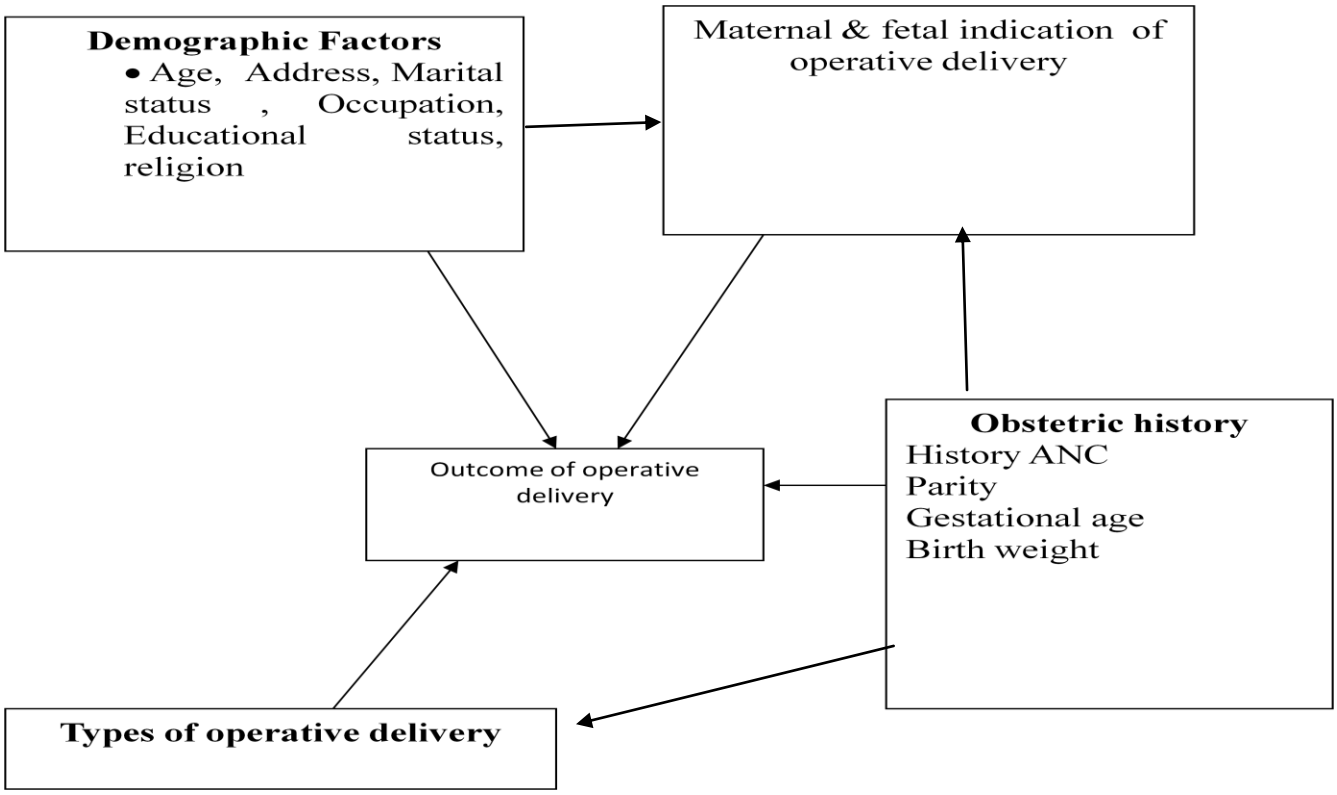


Figure-1 : conceptual frame work for operative delivery , its outcome and associated factors

CHAPTER—THREE

OBJECTIVE OF THE STUDY

General objectives

To assess pattern and outcome of operative deliveries among mothers who give birth by operative delivery in Nekemt Referral Hospital during the study period.

Specific objectives

1. To determine patterns of operative deliveries among mothers who give birth by operative delivery in Nekemt referral hospital.
2. To determine common indication of operative deliveries among mothers who give birth by operative delivery in study area.
3. To describe outcome of operative deliveries among mothers who give birth by operative delivery in Nekemt referral hospital.
4. To identify factors associated with outcomes of operative delivery among mothers who give birth by operative delivery in study area.

CHAPTER FOUR

METHODS, SUBJECT AND MATERIALS

4.1 Study area*:*

The study was conducted in Nekemte referral hospital from Dcember/2012-April/2013. The hospital is located in Nekemte Town , East Wollega Zone of Oromiya regional state, Ethiopia at 331km far from Addis Ababa.

The hospital is serving for a total population of over 2 million peoples of Nekemte Town, East Wollega Zone, parts of west Wollega Zone, Horo guduru Wollega Zone and West Shoa Zone.

Currently, Nekemte referral hospital provides both outpatient and inpatient services. It has medical, obstetrics and gynecology, surgical, and pediatrics ward for the inpatient services. It has a total of 178 beds among these 32 beds for obstetrics and gynecology ward and also has 4 delivery couches.

In this hospital there are a total number of 239 workers, 150 health professionals and 89 administrative staffs, from the health professionals 2 gynecology, 9 midwifery, 3 nurse and 1 health officer in obstetrics and gynecology ward.

4.2 Study design and period

A prospective cross sectional study on patterns and outcome of immediate post operative deliveries was conducted at Nekemte referral Hospital from December /2012-April/2013.

4.3 Population

4.3.1 Source population

All mothers who had deliveries in Nekemet referral hospital within the study period

4.3.2 Study population

All mothers who had operative deliveries in Nekemet referral hospital during the study time.

4.4 Inclusion and Exclusion criteria

Inclusion criteria: All post operative mothers within the 1st 24hrs of operative delivery and delivered at the hospital after 28wk of gestational age

Exclusion criteria: Critically ill mothers and mothers with hearing impairment.

4.5 Sample size determination and sampling technique

4.5.1 Sample size

Sample size- determined by using the formula

$n = \frac{(z_{1-\alpha/2})^2 p(1-p)}{D^2}$ where n= sample size

z=standard normal variance 95% confidence

P=prevalence of abdominal operative delivery (=0.5, unknown)

D= level of precision (5% degree of error)

$n = \frac{(1.96)^2 0.5(1-0.5)}{(0.05)^2}$ ➡ n=384

4.5.2 Sampling technique

All mothers coming to Nekemt referral hospital for delivery services during the study period and who full fill the inclusion criteria will be included in the study consecutively until the necessary sample size is achieved.

4.6 Study variables

4.6.1 Dependent variables

Pattern and outcome of operative deliveries

4.6.2 Independent variables

- Type of operative deliveries
- Indication of operative deliverie

Maternal factor:

-Parity

-ANC follows up

-Gestational age

Fetal factor:

-Weight of new born

Socio-demographic or background variables:

-Age
-Marital status
- Educational status
- Ethnicity
- Religion
- Occupational status

4.7 Data collection tool and procedures

Structured questionnaire and document review check list was developed and adapted after review of relevant literatures and standard text books (2, 4, 8, 11, 25). Data were collected through face to face interview and reviewing maternal record after operative deliveries by four trained midwifery nurses who are employed in the hospital supervised by one final year IEOS student..

4.8 Data quality control

The questionnaire and review check list was pre-tested on 5 %(19) mothers who had given operative deliveries in Nekemte referral Hospital . Possible amendments were made to the tool based on the findings of the pre-test. Intensive two days training was given data collectors and supervisor by the principal investigator on the objective of the study, how to interview and how to fill the checklist . Furthermore, the principal investigator and supervisor had day to day supervision and provided feedback and correction on daily basis for the data collectors. Completeness, accuracy, and clarity of the collected data were checked carefully. Any error, ambiguity, incompleteness encountered was addressed on the following day before starting next day activities.

4.9 Operational term definitions

1. Operative delivery - obstetric procedure in which active (operative) measures either abdominal (caesarean delivery) or vaginal are taken to accomplish deliveries (3).
2. Cesarean delivery - delivery of the fetus through a surgical incision through the abdominal wall (laparotomy) and uterine wall (hysterotomy) .
3. Elective cesarean section - operation that done at a pre-selected time before onset of labour, usually at completed 39 weeks (27).
4. Emergency cesarean section – the operation is done after onset of labour
5. Operative vaginal delivery – applying direct traction on the fetal skull with forceps or vacuum.
6. Destructive delivery- operation that reducing the size of the head, shoulder girdle or trunk of the dead fetus to allow its vaginal delivery
7. Parity - number of births (both life birth infants & stillbirth) of at least 28 weeks of gestational age (26).

   Para one – a single delivery experience (26).

Multipara- deliveries experience between two-four (26).

Grandmultipara- delivery experience greater than or equal to five (26)

10. Gestational age- the duration of the pregnancy since the last menstrual period

Preterm- <37 weeks

Term- 37-42 weeks

Post term- >42 weeks

11. APGAR- a score for the new borns based on appearance, heart rate, grimace, activity (movement) and response at first and 5^{th} minute

12. Favorable maternal outcome – mother alive with on complication after operative deliveries.

13. Unfavorable maternal out come – mother alive with complication like infection, birth canal injury, hemorrhag including death after operative deliveries .

14. Good neonatal outcome –neonatal outcome without any complication

15. Bad neonatal outcome –neonatal outcome with complication like stillbirth, early neonatal death, infection, injury …

4.10 Data processing and analysis

Data were entered and analyzed using SPSS version 16.0 windows soft ware computer program and interpreted with frequencies, rates, and percentages. Bivariate logistic regression analysis was made to obtain odds ratio and the confidence interval of statistical associations. Then, to control the confounding effect of other variables and to determine associated factors on management outcomes of operative deliveries , enter method multivariate logistic regression analysis was carried out by taking significant variables in the bivariate logistic regression model. The strength of statistical association was measured by adjusted odds ratios and 95% confidence intervals. Statistical significance was declared at $P < 0.05$. Results of the study were presented in graphs, tables, and pie charts accordingly.

4.11 Ethical consideration

Letter of ethical clearance was obtained from Research Ethical Committee of Jimma University and letter of permission was obtained from Nekemt referral hospital. Verbal consent obtained from the individual respondent before data collection. Additionally confidentiality of the patient information was kept.

4.12 plan for dissemination

Finding will be presented during Master's thesis defense. The result of this study will be submitted to the department & disseminated to the study site and other concerned bodies. Also there will be an attempt to publish the result in peer reviewed journal.

CHAPTER: FIVE
RESULT

5.1 Socio-demographic characteristics

Between December 1/2012-April 30/2013GC there were a total of 384 operative deliveries among which about 351(91.4%) were in the age group 18-34 years and (97.7%) were married. Most of them came from outside Nekemt - 287(74.7%) and Oromo by ethnicity- 316(82.2%). Majority of them were protestant 210(54.7%) followed by orthodox -131(34,1%) an198 (51.6%) housewife by occupation. Most of the study subjects were illiterate 213(55.5**%)**

Table 1. Socio-demographic characteristics of operated mothers at Nekemt Referral Hospital, April,2013

Socio-demographic characteristics		Frequency(n=384)	%
Age	<18	4	1.0
	18-34	351	91.4
	≥35	29	7.6
Marital status	Married	376	97.9
	Single	5	1.3
	Widowed	3	0.8
Address	In Nekemt town	97	25.3
	out of Nekemt	287	74.7
Ethnicity	Oromo	317	82.4
	Amhara	42	10.9
	Gurage	17	4.4
	Tigre	8	21
Religion	Orthodox	131	34.1
	Muslim	40	10.4
	Protestant	210	54.7
	Catholic	3	0.8
Occupational status	House wife	198	51.6
	Gev'tal employed	38	9.9
	Student	5	1.3
	Merchant	18	4.7
	Daily labour	6	1.6
	Farmer	119	31.0
Educational status	Illiterate	213	53.1
	Read and write	34	8.9
	1-6	57	14.8
	7-12	51	13.3
	Above grade 12	29	7.6

5.2 Obstetric history

Most of the study subjects 174(45.3%) were Para one. Majority of them were term by their gestational age 358(93.2%) and had no ANC follow up of 124(32.3%). Most of them had emergency cesarean section 261 (68.0%) (**Table 2**) .

Table 2 Obstetric history of operated mothers at Nekemt Referral Hospital, April,2013

Obstetric history		Frequency (n=384)	%
Parity	Para 1	174	45.3
	Para 2-4	155	40.4
	Para 5& above	55	14.3
Gestational age	Pre term	19	4.9
	Term	358	93.2
	Post term	7	1.8
ANC	Yes	260	67.7
	No	124	32.3
Type of c/s (n= 279)	Elective	261	93.5
	Emergency	18	6.5

5.3 Pattern of operative deliveries

Between December 1/2012- April 30/2013GC there were a total of 1160 deliveries at Nekemet Referral Hospital, out of which 384 (33.1%) gave birth by operative deliveries among which 71 (18.5%) of them were operative vaginal and the rest were operative abdominal deliveries (Fig.1)

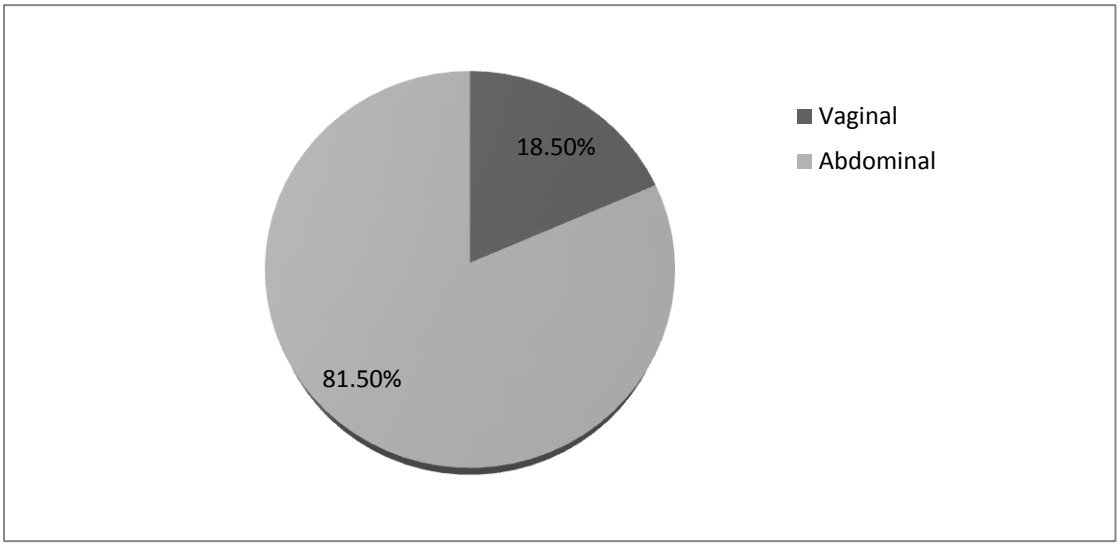


Figure 2. Distribution of operative deliveries at Nekemt Referral Hospital, April,2013

From the total deliveries within five month, among operative vaginal deliveries 43(11.2%) vacuum, 14(3.6%) forceps and 14 (3.6%) were destructive deliveries. From operative abdominal deliveries 279 (72.5%) c/s, 3 (0.8%) cesarean hysterectomy and 31(8.1%) laparatomy was done for uterine rupture.

5.4 Indication of operative deliveries

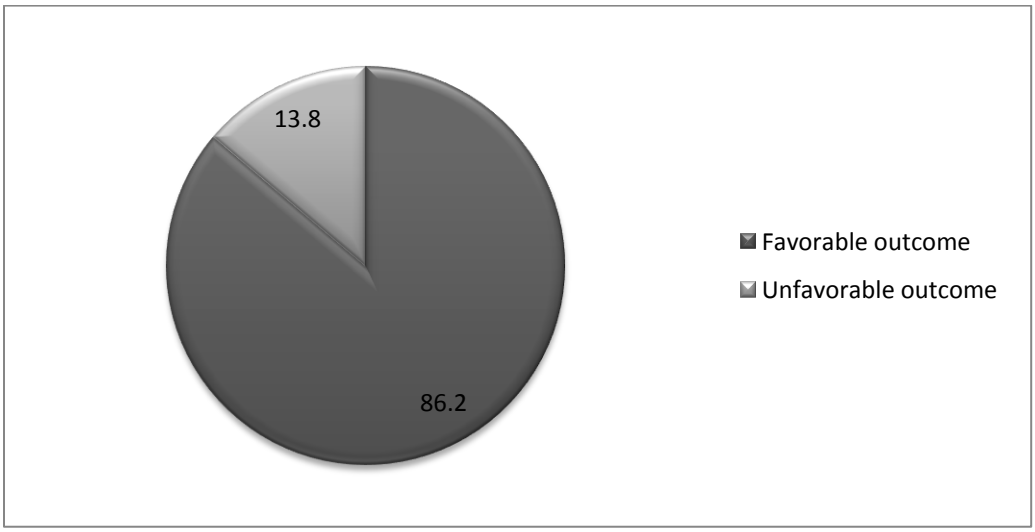
Based on the study finding the most common indications for vacuum and forceps deliveries was fetal distress 33(57.9%) and for the destructive deliveries CPD 9(64.2%). From operative abdominal deliveries the major indication for cesarean section were obstructed labour 58(20.8%), fetal distress(NRFHRP) 47(16.8%) and CPD 40(14.3%) additionally the major indication for cesarean hysterectomy in this study was uncontrolled hemorrhage .

Table 3: Indication of operative deliveries at Nekemt Referral Hospital, April,2013

Indication of operative delivery		**Frequency**	**%**
Vacuum and forceps(n=57)	Fetal distress (NRFHRP)	33	57.9
	Prolonged 2nd stage of labour	23	40.3
	Shorten 2nd stage of labour for maternal condition	1	1.8
Destructive (n=14)	CDD for dead fetus	9	64.4
	Obstructed labour	3	21.4
	After coming head for dead fetus	2	14.3
Cesarean section (n=279)	Obstructed labour	58	20.8
	Fetal distress (NRFHRP)	47	16.8
	CPD	40	14.3
	Previous c/s	39	13.9
	Mal presentation and mal position	36	12.9
	APH	23	8.2
	Failed induction	20	7.2
	Others	12	4.3
	Cord prolapsed	4	1.4

5.6 Outcome of operative deliveries

From the study subjects 53(13.8%) had unfavorable outcome like infection, postpartum hemorrhage, fistula (VVF) and hysterectomy within the first 24 hours (immediate post operation) and maternal death within the first 24 hours.



Figur.3 Maternal outcome of operative deliveries at Nekemt Referral Hospital, April,2013

Concerning neonatal outcome, out of all operative deliveries 162(41.9%) had bad neonatal outcome including stillbirth, early neonatal death infection injury by instrumental application and 45(11.7%) had low apgar score in the 5th minute. The majority of the neonate had birth weight (BW) between 2500-3999gram.

Table 4: neonatal outcome of operative deliveries at Nekemt Referral Hospital, April,2013

Neonatal out come	Frequency (n=384)	Percent
Apgar ≥7	277	72.2
Apgar <7	45	11.7
stillbirth	62	16.1
Good outcome	222	58.1
Bad outcome	162	41.9
<1500gm BW	3	0.8
1500-2499gm	18	4.7
2500- 3999gm	297	77.3
≥4000gm	66	17.2
Total	384	100

5.7 Factor associated with outcome of operative deliveries

5.7.1: Factor associated with maternal outcome of operative deliveries

On bi-variate binary logistic regression analysis age, residence, type of operative delivery, ANC and parity are significantly associated with maternal outcome in which mothers with the age ≥ 35years 3.8 times, came from out of Nekemet 6.6 times, abdominal delivery 4.3 times, had no ANC followup 8 times and grand multiparity 6.1 times more likely to have unfavorable materna outcome of operative delivery. However; on multivariate binary logistic regression analysis ANC and parity were the independent factors associated with maternal outcome adjusted for the other factors in which mothers who had no ANC follow up are 7.7 times more likely to have unfavorable maternal outcome than those who had ANC follow up with 95% CI of 3.7-15.7, mothers who were grand multipara had 4.8 times more likely to have unfavorable maternal outcome as compared to perimipara with 95%CI of 1.8-12.6**(Table 5)**

Table 5: Bivariate and multivariate logistic regression analysis of factors affecting maternal outcome at Nekemt referral hospital, April,2013

Variables		**Maternal outcome**		**COR(95%CI)P**	**AOR(95%CI)P**
		Favorable	Unfavorable		
Age	<18	4	0		
	18-34yrs	308	43	1	
	≥ 35	19	10	3.8 (1.6-8.6) *	
Residence	In Nekemet	94	3	1	
	Out of Nekemet	237	50	6.6 (2.0-21.7) *	
Type of operative delivery	Vaginal	68	3	1	
	Abdominal	263	50	4.3 (1.3-14.2) *	
ANC	Yes	246	14	1	1
	No	85	39	8 (4.1-15.5) *	7.7(3.71-15.8) *
Parity	Primipara	162	12	1	1
	Multipara	136	19	0.98 (0.53-1.8) 0.96	1.6(0.7-3.6) 0.37
	grandmultipara	33	22	6.18 (3.13-12.16) *	4.9 (1.8-12.65) *

*significant association at p<0.05

* Unfavorable maternal outcome: mother alive with complication like infection, birth canal injury, hemorrhage, fistula, toot drop, bladder injury and also including death after operative deliveries.

5.7.2 : Factor associated with Neonatal outcome of operative deliveries

On multivariate binary logistic regression parity, ANC and type of operative delivery were the independent factors associated with immediate neonatal outcome. In which neonate born from grand multipara mothers 2.2 times more likely to have bad neonatal outcome than those who born from perimipara with 95% CI of 1-4.8 and neonate who born from mother who had no ANC follow up 2.7 times more likely to have bad neonatal outcome after operative delivery as compared to who had ANC follow up with 95% CI of 1.6-4.5. Additionally neonates who born by operative abdominal delivery 80% less likely to have bad neonatal outcome than who born by operative vaginal delivery with 95% CI of 0.1-0.**4 (Table 6)**

Table 6: Bivariate and multivariate logistic regression analysis of factors affecting neonatal outcome at Nekemt referral hospital, April,2013

Variable		Immediate (n=384) neonatal outcome		COR(95%CI)P	AOR(95%CI)P
		Good	Bad		
Parity	Perimipara	94	80	1	1
	Multipara	105	50	0.6 (4-0.9)*	0.7 (0.4-0.1)0.09
	Grand multipara	23	32	1.6 (0.9-3)	2.2 (1-4.8)*
ANC	Yes	174	86	1	1
	No	48	76	3.2 (2-5)*	2.7 (1.6-4.5)*
Type of operative delivery	Abdominal	19	52	0.2 (0.1-0.4) *	0.2 (0.1-0.4)*
	Vaginal	203	110	1	1

*significant association at p<0.05

* Good neonatal outcome: neonatal outcome without any complication

* Bad neonatal outcome: neonatal outcome with complication like infection, early neonatal death, stillbirth, injury after operative deliveries.

CHAPTER SIX
DISCUSSION

Operative delivery is defined as any procedure undertaken to facilitate the delivery of the fetus. The success of such a procedure depends on the skill and or the experience of the operator. The timing of such an intervention must be in the interest of both the mother and the baby. This study tried to identify patterns indications maternal & immediate neonatal outcomes and factors associated with outcomes of operative delivery among mothers who give birth at Nekemt Referral Hospital.

In this study the rate of application of vacuum and forceps were 11.2% and 3.6% respectively.. Comparing this study finding with the research done in Nigeria, 2000- 2003, it is almost similar finding that is instrumental vaginal delivery was 11.4% (22).

The rate of cesarean section from operative delivery (72.6%) and from general delivery (24%) this result is higher than the WHO organization upper limit of 20%, 8% of CSR in previous study at Jimma Hospital and 10% at Tikur Ambesa teaching hospital (24, 25,28). This indicates that there are some unnecessary cesarean section procedures or it shows the need to revise indication of cesarean section at the hospital to avoid possible post operative com cesarean section plications .

The study also identified variations in the indications of cesarean section from other study done in the country in which the major indications of cesarean section in the current study are obstructed labour , fetal distress and CPD where as in Tikur Ambesa teaching hospital are previous cesarean section ,CPD and APH (24). As mentioned above the most common indication of cesarean section in this study is obstructed labour as compared to the study done at Black Lion Teaching Hospital, this might be due to mother coming from remote area and lack of transportation.

This study indicates that majority of women who give birth by cesarean section were primepara 46.2%, this can be due to the 1st and 3rd most indications for cesarean section were obstructed labour and CPD which are more common in untested pelvis of prime's. From operative abdominal deliveries laparotomy were done for uterine rupture. All of them were multiypara that might be due to higher incidence of uterine rupture in this parity.

There were three maternal death following intervention of operative deliveries with in the first 24 hours of post operation and 13.0% women developed other complication after the intervention of operative deliveries like infection, fistula and hysterectomy(i.e permanent infertility) . AS compared with five maternal death reported in Tikur Ambesa Teaching Hospital study within one year period (24) and this might be due to obstructed labour was the first most indication for cesarean section which was increase risk of maternal morbidity and mortality.

In this study there were around 41.9% of the neonate had bad neonatal outcome including still birth, early neonatal death, injury due to instrumental application and the like and there were 16.1% stillbirth and 3.4% early neonatal death as compared to Black Lion Teaching Hospital there were 2.8% stillbirth and 4.2% early neonatal death within one year study period (24). For this result the reason might be obstructed labour is the most common indication for cesarean section , late intervention due to delay on arrival and lack of facility for neonatal services as compared to Black Lion Teaching Hospital.

On multivariable logistic regression ANC and parity were the independent factors associated with maternal outcome adjusted for the other dependant factors in which mothers who had no ANC follow up were 7.7 times more likely to have unfavorable maternal outcome than those who had ANC follow up , mothers who were grand multipara had 4.8 times more likely to have unfavorable outcome as compared to perimigravida

On multivariable logistic regression parity, ANC and type of operative delivery are the independent factors associated with immediate neonatal outcome. In which neonate born from grand multipara mothers 2.2 times more likely to have bad neonatal outcome than those who born from perimipara and neonate who born from mothera who had no ANC follow up 2.7 times more likely to have bad neonatal outcome after operative delivery as compared to who had ANC follow up. Additionally neonates who born by operative abdominal delivery 80% less likely to have bad neonatal outcome than those who born by operative vaginal delivery. Over all the findings indicated that Parity and ANC are the most important factors those needs great attention in improving post operative maternal and neonatal outcomes without neglecting the other factors.

Strength and Weakness

Even though the study come up with important findings that can have an input in obstetric care and short term prospective as strength ,it has some weakness that it does not go beyond the first 24 hours of post operative time to see the effect of post operative delivery complications which could have been better if the study covered the full postnatal period to investigate the outcome of operative deliveries.

CHAPTER SEVEN

CONCLUSION AND RECUMENDATION

7.1 Conclusion:

- In this study the proportion of operative delivery in Nekemt referral hospital was 33.1%
- From operative delivery in Nekemt referral hospital 81.5% was operative abdominal delivery.
- Cesarean section rate is higher than the upper limit of WHO cut of lion (24%).
- The most common indication for instrumental vaginal delivery was fetal distress and for cesarean section was obstructed labour.
- In this study there were 13.8% of the operated mothers had unfavorable outcome and for the neonate 41.9% had bad immediate neonatal outcome.
- Parity ,ANC and type of operative delivery are significant factors association with maternal and neonatal outcome.

7.2 RECOMMENDATION

1. Since the C/S rate is higher than the upper limit of WHO cut of line , Nekemt Hospital Gynecologist and obstetrician should pay due attention to the indication of cesarean delivery to avoid unnecessary C/s .
2. Early diagnosis and immediate referral should be emphasized by all health care providers at primary level to reduce the causes of preventable C/S.
3. Special attention should be given to laboring mothers with grand multiparty parity and non ANC attendants to minimize the possible post operative complications by health care providers in Nekemt hospital.
4. The federal ministry of health in collaboration with Oromiya Health Bureau should encourage the primary health care provider to carry out extensive community based mobilization on birth spacing and standard ANC utilization
5. Finally, long term prospective study is recommended to identify the independent predictors of operative delivery outcomes .

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ANNEX-1 QUESTIONNAIRE

Questionnaire format: To be filled for index mother who had operative deliver in Nekmet

Referral Hospital

Informed Consent:

My name is _____. I am serving as a data collector for a the study done on patterns and outcome of operative deliveries conducted in Nekemte referral hospital by MSC in integrated emergency surgery student of Jimma university. I would like to inform you that the responses that you provide the questions are very essential not only for the successful accomplishment of the study but also for providing relevant information which will be helpful in improving the operative deliveries. To ensure confidentiality of your response, your name will not be recorded on the questionnaire. The interview will take only 20 minutes.

Do you agree to participate in the interview and to provide the required information for the study?

If yes, proceed

If no, thank and stop here. _____ _____

Name and Signature of interviewer

Certifying that respondent has given informed consent verbally

Supervisors name and signature _____

Instruction: The respondents must be mother herself or close relatives if she was unable to communicate and from her documentation card.

Please encircle the letter corresponding to the correct response or write the response of the respondent on the space provided

I. Identification

1. Questionnaire I.D:_____

2. Card No_____

II. Socio demographic characteristics

1. Age_____

2. Marital status_____

A. Married C. Widowed

B. Single D. Divorced

3. Address_____

A. in Nekemt town B. out of Nekemt towm

4. Occupational status

A. House wife C. NGO E. Merchant

B. Government employee D. Student F. Daily laborer

G. Others (specify)_____

5. Educational status (Grade completed)

A. Illiterate D. 7-12th grade

B. Read and Write

C. 1-6TH grade F. College or university

6. Ethnicity

A. Oromo D. Tigre

B. Amhara E. Others (specify)_____

C. Gurage

7. Religion

A. Orthodox B. Muslim C. Protestant

D. Catholic E. Other (specific)_____

III. Obstetric variables

1. Parity_____ (in number)

A. 1 B. 2- 4 C. $\geq$ 5

2. Does she have ANC follow up

   A. Yes B. NO

3. Gestational age (with LMP, physical examination ,or U/S)

   A. Preterm B. Term C. Post term

4. Mode/type of operative delivery

   A. Vaginal B. Abdominal (**go to question NO. 16**)

5. Type of operative vaginal Delivery

A. Vacuum (**go to question 6**)

B. Forceps (**go to question 9)**

C. Destructive deliveries (**go to question 13**)

6. Indication of vacuum delivery

   A. Fetal distress (> 8cm, full dilated)

   B. Prolonged 2nd stage labour

   C. Short 2nd stage labour for maternal indication

   D. Other (specify)_____

7. Maternal complication after vacuum delivery

   A. Cervical laceration D. 3rd and 4th degree tears

   B. Sever vaginal laceration E. Other specify_____

   C. Vaginal hematoma

8. Neonatal complication after vacuum delivery

   A. Fetal scalp laceration and bruising E. intracranial hemorrhage

   B. Cephalo hematoma F. other specify_____

   C. Subaporeurotic hemorrhage

   D. Skull future

9. Type of forceps delivery_____

   A. Out let forceps B. low let forceps

C. Mid forceps D. Other (specify)_____

10. Indication of forceps delivery

A. Pronged 2nd stage of labour

B. Fetal distress (NRFHRP)

C. Shortening of 2nd stage for maternal stage

D. For after-coming head breech

E. other (specify)_____

11. Maternal complication for forceps delivery

A. Cervical tear

B. 3rd degree and 4th degree tear

C. Rupture of lower uterine segment

D. Other (specify)_____

12. Neonatal complication for forceps delivery

A. Fetal scalp laceration and bussing E. Intracranial hemorrhage

B. Skull fracture F. Facial nerve palsies

C. Cephalic hematoma G. Other (specify)_____

D. Subaponeurafic hemorrhage

13. Types of destructive delivery

A .Craniotomy B. Evisceration C. Decapitation

D. Cleindotomy

14. Indication of destructive delivery

A. Hydrocephalus B. Retained after coming head of the dead fetus

C. CPD dead fetus D. Obstructed labour E. Other (specify)_____

15. Maternal complication after destructive delivery

A. uterine rapture.

B injury of the genital tract.

C. other (specify)_____

16. Types of operative abdominal delivery

A. Cesarean delivery (emergencies, elective)

B. Cesarean hysterectomy

C. Laparatomy for (uterine rupture)

17. Maternal indication of cesarean delivery

A. CPD

B. Obstructed labour

C. APH (ante partum hemorrhage)

D. Abnormal uterine action (failed induction)

E. Previous uterine scar (like myomectomy)

F. Previous successful repair of VVF (vesico vaginal fistula)

G. Previous C/S

H. Other (specify) _____

18. Fetal indication for cesarean delivery

A. malpresentation and malposition

B. fetal distress (NRF HRP)

C. Prolapsed pulsating cord

D. Post-mortem c/s

E. other (specify)_____

19. Indication of cesarean hysterectomy

A. Uncontrollable postpartum hemorrhage

B. Placental adherence

C. Sever uterine infection

D. Other (specify)_____

Fetal outcome for all operative deliveries

20. Alive

A. Normal

i. APGAR score - at 1st min _____ at 5th min_____

ii. APGAR score - at 1st min_____ at 5th min_____

B. Congenital anomalies _____

21. Stillbirth (fetal death)_____

22. Birth weight (gram)_____

23. Maternal complication with in the first 24hr after operative deliveries

A. alive with no disability

B. alive with disability

I. Infection

II. Foot drop

III. Fistula

Iv. Other specify _____

D. death