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Original Research Article

Incidence of cesarean delivery after induction of labor with intravenous oxytocin drip among women undergoing induction of labor at Dessie referral hospital, Northeast Ethiopia, 2017

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ABSTRACT

Background: The number of delivering women undergoing an induction of labor is greater than 20% and continues to rise. Simultaneously, the cesarean delivery rate continues to increase as well. This increase has resulted from evidence-based recommendations on how to handle certain conditions. Labor induction has been associated with increased likelihood of cesarean birth for some groups of women.
Methods: Institutional based retrospective cross sectional study was conducted on 319 women medical chard who undergone induction of labor with oxytocin infusion at Dessie referral hospital. Systematic sampling techniques was used to select the samples. The data was cleaned, edited, coded, and entered in to EPI INFO version 3.5 and exported and analyzed by SPSS with windows version 20.0.
Results: A total of 319 delivery records were reviewed. Out of this 256 (80.3%) was successful induction of labor. Incidence of cesarean section after induction of labor with oxytocin infusion among women at Dessie referral hospital was 136 (42.6%). The most frequent cause of induction of labor was due to hypertensive disorder 133 (41.7%) followed by pre labor rupture of membrane 111 (34.8%). Cesarean section was done due to failed induction of labor 63 (19.7%) followed by fetal distress 40 (12.5%).
Conclusions: In present study incidence of cesarean delivery after induction of labor was 42.6%. Most frequent cause of induction of labor was due to hypertensive disorder followed by pre-labor rupture of membrane. Cesarean section was done due to failed induction of labor followed by fetal distress.

Keywords: Incidence, Cesarean delivery, Induction of labor

INTRODUCTION

Induction of labor is defined as artificial stimulation of uterine contractions to cause the delivery of fetus before the onset of spontaneous labor. Labor is typically induced by using one of the following methods: cervical ripening agents, artificial rupture of membranes, and uterine stimulation with oxytocin.[1-3]

Induction of labor is indicated when the benefits to either mother or fetus outweigh those of continuing the pregnancy. The World Health Organization (WHO) recommends labor induction be performed with a clear medical indication and when expected benefits outweigh potential harms. Major indications for induction of labor include post term pregnancies, pre-labor rupture of membranes, maternal medical conditions like hypertensive disorders, diabetes, renal diseases, fetal compromise, chorioamionitis, abruptio placenta, intrauterine fetal death and others. Elective induction of labour also takes place when a mother wishes to deliver at a particular time after term.[4-7]

Even though labor induction had varied benefits there is a risk to the mother or fetus, this intervention may result in undesirable effect. Induction sometimes fails with potential risks of increased rate of operative vaginal delivery, caesarean birth, excessive uterine activity, abnormal fetal heart rate patterns, uterine rupture, maternal water intoxication, delivery of preterm infant due to incorrect estimation of dates, and possibly cord prolapse. Medical problems that were present before pregnancy or occurring during pregnancy may contribute to these complications.[3,8-13]

The past few decades have witnessed an increase in cesarean section rate. This increase has resulted from evidence-based recommendations on how to handle certain conditions, such as fetal malposition, major placental abruption, placenta previa and prolapsed cord; however, it is mainly the consequence of a growing number of women presenting at labor with uterine scars, delivering at advanced ages, or demanding surgical delivery. Although increased frequency of obstetric interventions, induction of labor appears to have contributed to current trends in Cesarean section rates. Birth by caesarean delivery is generally more hazardous than a normal vaginal delivery, and also poses more risks for subsequent pregnancies.[6,14-16]

Labor induction has been associated with increased likelihood of cesarean birth for some groups of women: first-time mothers and women whose cervix is not soft and ready to open or ripen cervix.[17] In addition with controversies surrounding the use of induction with oxytocin to initiate labor and the absence of technological supports to evaluate likelihood of success in resource limited settings, there are little evidences in relation to incidence of cesarean section after induction of labor in Ethiopian hospitals. So, in this study we aimed to assess incidence of cesarean delivery after induction of labor with intravenous oxytocin drip among women undergoing labor induction at Dessie referral hospital.

METHODS

Study settings and design

A facility based cross sectional study was conducted on women undergone induction of labor during the study period of 1st January to 30th February 2017 GC at Dessie referral hospital, Dessie town, south east Ethiopia. Single population formula was used to calculate the sample size, by using 21.4% of the proportion of failed induction of labor. Systematic random sampling technique was used to select sample from the list of women undergone induction of labor.

Study population

All pregnant women who gave birth after 28 weeks of gestation age in Dessie referral hospital and selected as study. Mothers who gave birth after 28 weeks of gestation, singlet on with cephalic presentation were included.

Data collection methods

Data was collected from medical records of women for whom induction of labor was performed in Dessie referal hospital using pre tested structured checklist. Items were developed for this study to assess socio demography factors, obstetric factors, types of induction performed and health indication for labor induction. Checklist consist five sections that have a total of 23 items which describe the purpose of the study.

Analysis

After checking its completeness and appropriateness, the collected data was entered by EPI INFO version 3.5 and exported to SPSS version 20.0 for analysis. Different statistical analysis was undertaken. The analyzed data was presented using texts, tables, charts and graphs.

Ethical consideration

Ethical clearance letter was obtained from ethical review board of Wollo university college of health sciences. Official permission letters were also obtained from Dessie town health department and for Dessie referral hospital. Confidentiality and anonymity of the record had been ensured throughout the execution of the study by taking only the required information without using the name of the client.

RESULTS

Socio-demographic characteristics

A total 319 medical records of mothers who gave birth after induction of labor were selected for study purpose. The age of the study subjects ranged from 19-37 years and mean age and standard deviation of the selected women was 25.97 (SD=4.81) and 256 of all samples were below 30 years of age (Table1).

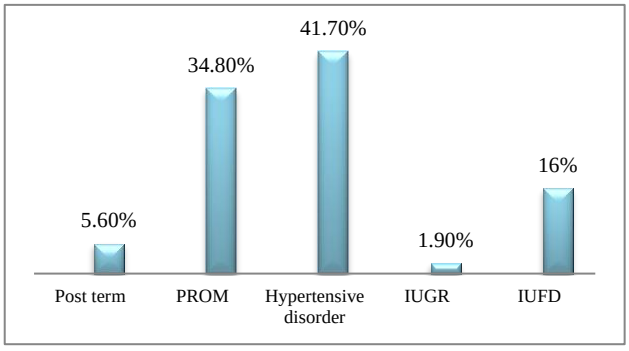

Figure 1: Indication of induction of labor among women deliver in Dessie referral hospital, Ethiopia, 2017.

Obstetric condition

Most of the women 198 (62.1%) were primiparous. The mean gestational age was 37.96 weeks (range: 32-43 weeks) (Table 2). Of the included 319 women, 133 (41.7%) undergone induction of labor due to hypertensive disorder followed by 111 (34.8%) due to premature rupture of membrane (PROM) (Figure 1).

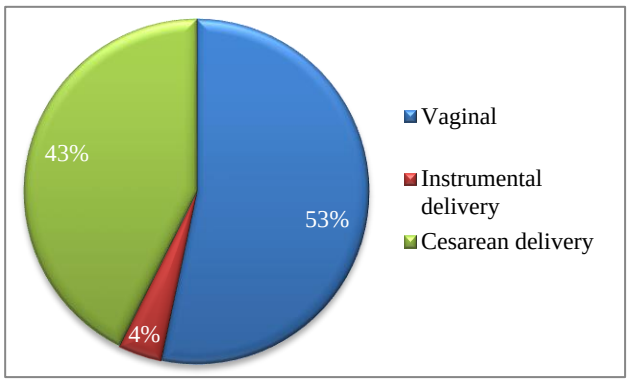

Figure 2: Mode of delivery among women who undergone induction of labor in Dessie referral hospital, Ethiopia, 2017.

Table 1: Socio demographic characteristics women who undergone induction (n=319).

Characteristics	Frequency	Percentage
Age (in years)		
≤20	48	15
21-25	127	39.8
26-30	103	32.3
31-35	25	7.8
≥36	16	5
Religion		
Orthodox	65	20.4
Muslim	251	78.7
Protestant	3	0.9
Ethnicity		
Amhara	319	100
Marital status		
Married	319	100
Educational level		
Unable to read and write	51	16
Grade 1-8	102	32
Grade 9-12	97	30.2
Collage and above	69	21.6
Occupation		
Unemployed	247	77.4
Formal employment	72	22.6
Residential address		
Urban	214	67.1
Rural	105	32.9

Incidence of cesarean delivery

Out of the total 170 (53.3%) of women delivered vaginally within 8 hours after induction was started, while 136 (42.6%) delivered by cesarean section (CS) (Figure 2).

Table 2: Obstetric condition of women who undergone induction of labor from 1st September to 31st August in 2015 (n=319).

Obstetric conditions	Frequency	Percentage
Parity		
Para 1	198	62.1
Para 2	99	31.0
Para 3	3	0.9
Para 4	16	5.0
Para 5 and above	3	0.9
Indication of induction		
Post term	18	5.6
PROM	111	34.8
Hypertensive disorder	133	41.7
IUGR	6	1.9
IUFD	51	16.0
Gestational age		
Preterm	84	26.3
Term	191	59.9
post term	44	13.8
Membrane rupture before induction		
Yes	111	34.8
No	208	65.2
Bishop score		
Favorable	228	71.5
Unfavorable	91	28.5

IUGR: intrauterine growth retardation, IUFD: intrauterine fetal death.

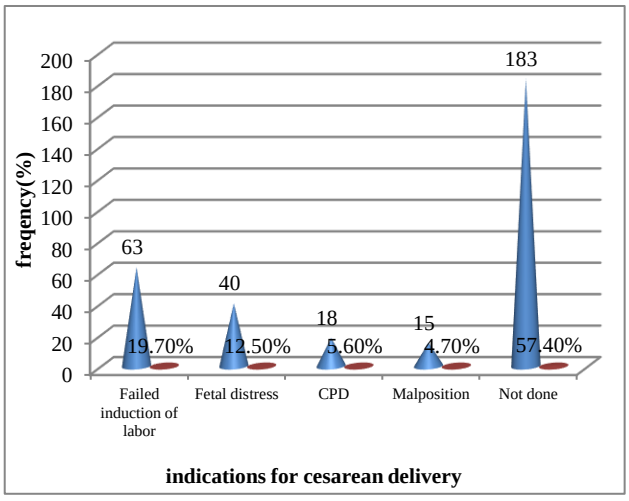

Figure 3: Reasons for cesarean section among women delivered after induction of labor in Dessie referral hospital, Ethiopia, 2017.

From women who delivered by cesarean section 63 (19.7%) undergone CS due to failed induction of labor, 40 (12.5%) were due to fetal distress (Figure 3). From a total of 319 women sampled in 12 (3.8%) of the cases membranes were changed into meconium after induction of labor. Following induction in 15 (4.7%) of the cases fetal heart rate were recorded as non-reassuring (Table 3).

Table 3: Outcome of induction of labor among women who undergone induction of labor from 1st September to 31st August in 2015 (n=319).

Characteristics	Frequency	Percentage
Time taken for induction (hrs)		
<8	118	37
8-16	185	58
>16	16	5
Non reassuring fetal heart rate		
Yes	15	4.7
No	304	95.3
Change of liquor to meconium		
Yes	12	3.8
No	307	96.2
Mode of delivery vaginal	170	53.3
Instrumental delivery	13	4.1
Cesarean delivery	136	42.6
Indications for cesarean delivery	63	19.7
Failed induction of labor	40	12.5
Fetal distress	18	5.6
CPD malposition	15	4.7
Not done	183	57.4
Alive fetus		
Yes	252	79
No	67	21
Birth weight (g)		
<1500	19	6
1500-2499	64	20.1
2500-3999	204	63.9
>4000	32	10
APGAR score		
<seven	125	39.2
>seven	194	60.8

DISCUSSION

Induction of labor is one of the fastest growing procedures in current obstetric practice. The increasing incidence of induction of labor may be attributed to multiple possible causes. Increasing trends of maternal morbidity, which as previously discussed may increase the number of medical indications for IOL, are one possible cause. However, the fact that higher remunerative payers are associated with higher rates of IOL suggests that nonclinical factors such as provider or patient preference may also play a role. The World Health Organization and the American college of nurse-midwives (ACNM) both advocate that IOL should only be performed when there is a clear medical indication supported in the literature and the benefits outweigh the potential harms.in addition to that Labor induction has been associated with increased likelihood of cesarean birth for some groups of women like primigrava mother and those mothers and women whose cervix is not soft and ready to open or ripen cervix.

The present study showed that mode of delivery was Normal Vaginal delivery 53.3%, cesarean delivery 42.6% and 4.1% via instrumental delivery. This finding is in line with cesarean section rate in the study conducted at Dessie town hospitals.[18]

The main indication of induction in this study were hypertension during pregnancy following pre labor rupture of membrane, intrauterine fetal death, post term pregnancy and intrauterine growth retardation. Similarly, the study done in Kathmandu Medical College Teaching Hospital showed predominant indications for induction were: post term pregnancy, PROM, oligohydramnious, and others. In the study done at a regional hospital in KwaZulu-Natal, South Africa the three main indications for induction of labor were hypertensive disorders, post-dates pregnancy and pre-labour rupture of the membranes.[4] However, the study done Hawassa public health facilities showed predominant indications for induction were: premature rapture of membrane, preeclampsia, post term and chorioamnionitis. In the study done at Jimma University specialized hospital the three main indications for induction of labor were premature rupture of membrane, hypertension disorder and post-term.[12,13]

The main indications for cesarean delivery in this study were failed induction of labor followed by fetal distress, cephalo pelvic disproportion and malposition. Similar indication also reported by Mehta et al, Calder et al, Wilson et al and Macer et al, but Abdulkadir revealed that post term pregnancy the leading indications for cesarean delivery.[7,16,17]

CONCLUSION

In this study incidence of cesarean delivery after induction of labor with oxytocin infusion was 42.6%. The main indications for induction of labor were hypertension during pregnancy, pre labor rupture of membrane, intrauterine fetal death, post term pregnancy and intrauterine growth retardation. The main indications for cesarean delivery in this study were failed induction of labor, fetal distress, cephalo pelvic disproportion and malposition.

Data availability

The datasets generated and/or analyzed during the current study are not publicly available due to some privacy

reasons but are available from the corresponding author on reasonable request.

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