

International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622
© Gynaecology Journal
www.gynaecologyjournal.com
2024; 8(4): 01-06
Received: 02-04-2024
Accepted: 07-05-2024

Dr. Swapnali Garude
Department of Obstetrics and
Gynaecology, Nowrosjee Wadia
Hospital, Mumbai, Maharashtra,
India

Dr. Trupti Nadkarni
Department of Obstetrics and
Gynaecology, Nowrosjee Wadia
Hospital, Mumbai, Maharashtra,
India

Dr. Darshana Chowdhary
Department of Obstetrics and
Gynaecology, ESIS Mulund,
Mumbai, Maharashtra, India

Dr. Shreya Uttam Dahiwade
Indira Gandhi Government
Medical College, Nagpur, India

Corresponding Author:
Dr. Swapnali Garude
Department of Obstetrics and
Gynaecology, Nowrosjee Wadia
Hospital, Mumbai, Maharashtra,
India

Analysis of indications, methods, outcome of induction of labour in term nulliparous patient

**Dr. Swapnali Garude, Dr. Trupti Nadkarni, Dr. Darshana Chowdhary and
Dr. Shreya Uttam Dahiwade**

DOI: <https://doi.org/10.33545/gynae.2024.v8.i4a.1468>

Abstract

The goal of induction of labour is to achieve a successful vaginal delivery that is as natural as possible. The typical rates in India are about 10 to 11% are reported from tertiary medical centers. This incidence has increased over the past few decades and has raised the concern that it translates into an increased caesarean delivery rate.

Material and Method: This was a prospective observational study on induction of labour which included 105 participants under the care of 5 consulting units over period of 12 months.

Objective:

1. To study the comprehensive profile of labour induction.
2. To study the factors providing better success of induction of labour

Results: The factors which were considered important for prediction of successful vaginal delivery were maternal age, gestational age, bishops score. Induction of low-risk patients with gestational age of 39 to 40 weeks was effective achieving majority of vaginal delivery including instrumental delivery. In our study all the cases were with poor bishops score (<5), but significant difference was proved between bishops score for FTND, instrumental delivery and LSCS ($p < 0.001$). Preinduction AFI was also found to be predictor of IOL

The cases which ended up as failed induction, majority of them were with oral misoprostol as it was associated with poor bishops score (1 and 2). As cervical ripening was not achieved and, in some cases, fetal distress was present, oxytocin augmentation was not done in majority of cases.

Conclusion

- Careful assessment of the patients should be done to determine bishop score, gestational age, amniotic fluid index.
- Careful evaluation with individuating each case with giving adequate time to deliver with close intrapartum monitoring is needed.
- All the obstetric unit must audit the cases of failed induction and further attempts should be made for evaluating it for its shortcoming.

Keywords: Induction, Bishops, labour, FTND, LSCS

Introduction

Induction of labour is defined as the artificial initiation of labour before its spontaneous onset to deliver the fetoplacental unit. The goal of induction of labour (IOL) is to achieve a successful vaginal delivery that mimics natural birth process. The frequency of induction varies by location and institution. No national figures are available for India; hence research is required to study the factors contributing to the elective induction rate, cost effectiveness, induction practices at level of smaller facilities and at tertiary centre. The typical rates in India are about 10 to 11% are reported from tertiary medical centers [1]. This incidence has increased over the past few decades and has raised the concern that it translates into an increased caesarean delivery rate [2]. Hence, it is necessary from time to time to audit the procedure of induction of labour and re-evaluate the indication, mode of induction and outcome in terms of mode of delivery and maternal and fetal complications of the procedure.

Material and Methods

This study was Observational Prospective Study carried out in 5 different units of OBGY department of a tertiary care hospital of central India. Due to the different experiences of the consultants, with varied indications for induction, with different protocols in practice with a lot

of consideration, this study is actualized to see the comprehensive profile of labour induction.

Objective

- To study the comprehensive profile of labour induction.
- To study the factors providing better success of induction of labour

Inclusion criteria

All nulliparous women who had completed 37 weeks of gestation & had undergone induction of labour.

Exclusion Criteria

- PROM
- Multiple gestation
- IUFD
- Any congenital malformation
- Not willing to participate in the study

All patients in the post-natal ward who had delivered after induction of labour and who fulfil the inclusion & exclusion criteria were included in the study. The case record proforma was filled by taking details from the indoor paper. The patient was followed up for her course in the ward till discharge and data was analysed for period of 12 months after by ethics committee board approval.

Sample size - was determined using SAS 9.2 package.

Efficacy variable: Success Rate.

Null Hypothesis H₀: Success Rate - 77.5%.

H₁: Anticipated Success Rate - 87%.

Sample size: 105, Power 80%, Alpha - 0.05, Statistical test Z test for Binomial Proportion [3].

Statistical Analysis

Data was analysed using SPSS V15.0 (Statistical Package for Social Sciences, Version 15.0) package. Continuous variables are expressed as Mean and SD for normal data and median and range for non-normal data. Comparisons of continuous variables among groups was carried out by Student's unpaired t test for normal data and Mann Whitney U test for non-normal data. Categorical variables were expressed as frequencies and percentages and was compared between two groups using the Fisher exact test or Chi square test. Other statistical test is applied as per need. All statistical tests were two tailed. Alpha (α) Level of Significance was taken as $p \leq 0.05$.

Results and Analysis

Data was analysed using SPSS (Statistical Package for Social Sciences) Version 15.0 package. Data were given as Mean and SD for quantitative variables and Number (Percentage) for qualitative variables. ANOVA One way (F test) was applied to compare three groups. After getting significant difference by F test, post hoc Scheffe test was applied to compare pairs of means for statistical difference.

Chi square tests were applied to compare percentages among three groups. All statistical tests performed were two tailed. Level of Significance was taken as $p \leq 0.05$. S - Significant, NS - Not Significant, P - Probability value, DF - Degrees of freedom Study population n – 104. We had recruited 105 patients in our study however one case was lost to follow up. Hence, the final analysis of the study was conducted in the 104 complete cases.

The study consists of 53% of LSCS and 47% of vaginal delivery out of which 27% were FTND, 20% were instrumental delivery. 58% of cases were induced with foleys catheter, 23% were induced with misoprostol, 13% were cerviprime, 6% were induced with foleys catheter with misoprostol.

Mean maternal age of study population at the time of induction with outcome for FTND is 28.39, LSCS is 28.45 and instrumental delivery 27.67 with minimum of 19 yrs and maximum of 41 yrs.

Gestational age categories in which 37 to 38 weeks of gestation 20.4% had vaginal delivery while 29.1% had LSCS. In 38 to 39 weeks of gestation 12.2% had vaginal delivery while 23.6% had LSCS. In 39 to 40 weeks of gestation 46.9% had vaginal delivery and 21.8% had LSCS. Above 40 weeks 20.4% had vaginal delivery and 25.5% had LSCS.

Mean estimated birth weight of patients delivered by normal delivery was 2.7 kg, by LSCS was 2.61 kg, by instrumental delivery was 2.55kg. Mean amniotic fluid index of patients delivered by normal delivery was 11.36 cm, by LSCS was 10.63 cm, by instrumental delivery was 10.60 cm.

Number of patients with AFI < 5 cm delivered by emergency LSCS and instrumental delivery were 8 and 1 respectively whereas number of patients with AFI 5to 24 cm delivered by vaginal delivery (FTND +instrumental) was 48 and emergency LSCS 45. Patients who required LSCS had majority of indication of severe fetal distress followed by non-reassuring CTG (category 2 and category 3 IPM).

Patients with bishops score 0 had 0% FTND and 3.6% of LSCS. Bishops score 1 had 8.2% of FTND and 36.4% of LSCS. Bishops score of 2 had 32.7% of FTND and 32.7% had LSCS. Bishops score of 3 had 24.5% of FTND and 14.5% of LSCS. Bishops score of 4 had 26.4% FTND and 9.4% LSCS. Bishop score of 5 had 8.2% FTND and 3.6% of LSCS. Mean bishops score of patients delivered by ftnd had 3.11, Instrumental delivery of 2.71 and LSCS had 2. P value ($p < 0.001$) was significant for the BISHOP score. Significant difference in BISHOP score was found between FTND & LSCS.

Mean time from induction of labour going into active phase who delivered by FTND is 6.80 hrs, for patients who delivered by LSCS is 8.18 hrs and for patients who delivered by instrumental delivery is 5.81 hrs. Significant difference was seen with ($p = 0.005$) in mean time from induction to labour going in active phase between LSCS and instrumental delivery.

Mean time from IOL to delivery for FTND is 12.38 hrs, LSCS is 10.97 hrs, and instrumental delivery is 11.55 hrs.

Mean birth weight of patients who delivered by FTND is 3.11 kg, LSCS 2 kg, and instrumental delivery is 2.71 kg.

Table 1: Quantitative description of the study population who underwent labour induction with their derived variables, which are expressed as the mean, standard deviation, minimum and maximum values

	FTND (GR 1)	LSCS (GR 2)	INSTRU. (GR 3)	Comparison among 3 groups	Scheffe test
Age	28.39 ±4.01	28.45 ±4.52	27.67 ±3.76	F=0.3, NS, P=0.8	
Gest Age	39.26 ± 1.11	38.97 ±1.23	39.39 ±0.87	F=1.3, NS, P=0.3	
EBW	2.73 ±0.47	2.61 ±0.56	2.55 ±0.47	F=0.8, NS, P=0.5	
AFI	11.36 ±2.79	10.63 ±4.45	10.60 ±2.86	F=0.4, NS, P=0.7	
BISHOP score	3.11 ±1.20	2.00 ±1.17	2.71 ±1.00	F=9.4, S, P<0.001	1-2

Time from induction to onset of active labour	6.80 ±3.19	8.18 ±2.70	5.81 ±1.94	F=5.6, S, P=0.005	2-3
Time from induction to delivery	12.38 ±4.02	10.97 ±4.31	11.55 ±3.49	F=1.1, NS, P=0.3	
Baby Wt	3.11 ±1.20	2.00 ±1.17	2.71 ±1.00	F=0.3, NS, P=0.7	

With ANOVA ONE WAY (F test) and Scheffe Post hoc test after getting F value significant, it is concluded that there is no significant differences for all above variables except BISHOP score and Time from induction to onset of active labour among three groups.

Most common method of induction used in our institute was foleys catheter with most common indication as postdatism and hypertensive disorders.

Significant difference between mode of delivery with method of induction suggests that induction with foleys catheter (M1) has 69.4% of vaginal delivery including instrumental delivery and 47.1% has LSCS. Induction with foleys with misoprostol (M2) had 8.2% of vaginal delivery including instrumental delivery and 3.6% of LSCS. Induction with oral misoprostol (M3) had 18.4% of vaginal delivery including instrumental delivery and 27.3% of LSCS. Induction with cerviprime (M4) had 4.1% of vaginal delivery including instrumental delivery and 47.1% of LSCS. Oxytocin augmentation was needed for 65% cases of

foleys induction. In misoprostol induction, 88% cases did not require oxytocin augmentation.

Percentage of indication for LSCS or instrumental delivery for particular method of induction that is foleys induction had 35% cases of non-progress of labour and 23% cases had non-progress of labour with meconium stained liquor. Foleys with misoprostol had 50% of non-progress of labour and 50% cases had fetal distress. Oral misoprostol alone had majority of indication non-progress of labour 20%, failure of induction 20% and persistent category 3 intrapartum monitoring 20%. Cerviprime induction had fetal distress 33% and non-progress of labour 25% indication for emergency LSCS.

Number of patients not achieving active phase of labour and had failed induction is 16.34%. It is also seen pre induction bishops score, indication for induction and method of induction are the determining factor for failure of induction for which LSCS was done.

Table 2: Difference in Method of Induction & Indication of Induction amongst 3 groups using Chi square test

	FTND n= 28 (GR 1)	LSCS n=55 (GR 2)	INSTRU. n=21 (GR 3)	Comparison among 3 groups
Method of Induction	1=19(67.9%) 2=3(10.7%) 3=5(17.9%) 4=1(3.6%)	1=26(47.3%) 2=2(3.6%) 3=15(27.3%) 4=12(21.8%)	1=15(71.4%) 2=1(4.8%) 3=4(19.0%) 4=1(4.8%)	Chi sq.=10.8, DF=6, NS, P=0.09
Indication of Induction	1=6(21.4%) 2=16(57.1%) 3=0(0.0%) 4=2(7.1%) 5=0(0.0%) 6=0(0.0%) 7=2(7.1%) 8=2(7.1%) 9=0(0.0%)	1=9(16.4%) 2=23(41.8%) 3=2(3.6%) 4=10(18.2%) 5=0(0.0%) 6=0(0.0%) 7=7(12.7%) 8=1(3.6%) 9=3(5.5%)	1=3(14.3%) 2=11(52.4%) 3=2(9.5%) 4=1(4.8%) 5=1(4.8%) 6=1(4.8%) 7=0(0.0%) 8=1(4.8%) 9=1(4.8%)	Chi sq.=21.1, DF=16, NS, P=0.18

The types of indication of induction are depicted as gestational hypertension-1, Postdatism- 2, small for gestational age fetus - 3, Oligohydramnios- 4, chronic hypertension - 5, prolonged latent phase - 6, intrauterine growth restriction - 7, Preeclampsia - 8, gestational diabetes mellitus - 9, the methods of induction of labour are depicted as foleys catheter-1, Method of induction with foleys with misoprostol - 2, Method of induction with oral

misoprostol-3, Method of induction with cerviprime - 4 No significant difference observed in Method of Induction & Indication of Induction amongst no groups using Chi square test. Total 18 cases had NICU admissions which compared with method of induction, respiratory distress was more seen with misoprostol induction. Perineal tear as a maternal complication was associated more with instrumental delivery.

Table 3: Comparison of various methods of deliveries

	FTND (GR 1)	LSCS (GR 2)	INSTRU. (GR 3)	Comparison among 3 groups
Augmentation with Oxytocin	1=13 (46.4%) 2=15(53.6%)	1=28 (50.9%) 2=27(49.1%)	1=8(38.1%) 2=13(61.9%)	Chi sq.=1.0, DF=2, NS, P=0.6
NICU admission	1=3(10.7%) 2=25(89.3%)	1=11(20.0%) 2=44(80.0%)	1= 4(19.0%) 2=17(81.0%)	Chi sq.=1.2, DF=2, NS, P=0.6
Maternal complication	1=1(3.8%) 2=25(89.3%)	1=2(3.6%) 2=53(96.4%)	1= 3(14.3%) 2=18(85.7%)	Chi sq.=3.4, DF=2, NS, P=0.2
Reasons for NICU admissions	1=2(66.7%) 2=1(33.3%) 3=0(0.0%) 4=0(0.0%) 5=0(0.0%)	1=4(36.4%) 2=0(0.0%) 3=1(9.1%) 4=2(18.2%) 5=4(36.4%)	1=1(25.0%) 2=1(25.0%) 3=1(25.0%) 4=1(25.0%) 5=0(0.0%)	Chi sq.=8.4, DF=8, NS, P=0.4

Data: Number (%)

Statistical test: Chi square test

Legend: Augmentation with Oxytocin: Yes - 1, No - 2,

NICU admission: Yes - 1, No - 2,

Maternal complications: Yes - 1, No - 2

Reasons for NICU admissions: respiratory distress - 1, intubated in view of not cried immediately after birth - 2, birth asphyxia -3, low birth weight - 4, hypoglycaemia - 5. No Significant difference observed in all variables among 3 group using Chi square test.

Discussion

Method of induction and its progression was done according to protocols of 5 different units. The study also suggests that obstetricians has used induction of labor as interventions to reduce the risk of complications to mother and fetus by expediting the delivery process. Małgorzata Radoń-Pokracka *et al.* found that advanced maternal age (>40 years) was associated with decreased incidence of vaginal delivery and increased rate of caesarean section ($p = 0.0238$, OR 2.23). As our study majority are in age group of < 40 years, significant difference to be associated with could not be estimated.

Mean gestational age in our study for FTND (39.26 ± 1.11), LSCS (38.97 ± 1.23) & Instrumental delivery (39.39 ± 0.87). As our study also includes induction of labour for therapeutic reasons such as hypertensive disorders, diabetes mellitus, IUGR, small for gestational age foetus, oligohydramnios, induction were done before 39 weeks. Elective induction was done for postdatism in patients with from 40 to 41 weeks and not beyond 41 weeks. The study by Divon MY *et al.* 1998 showed a significant increase in the odds ratio for perinatal mortality and morbidity from 41 weeks' gestation onwards as induction for a post-term indication is shown to reduce the likelihood of perinatal death [5]. In our study, 39 to 40 weeks of gestation 46.9% had vaginal delivery and 21.8% had LSCS. Above 40 weeks 20.4% had vaginal delivery and 25.5% had LSCS.

We found a significant difference between the BISHOP score for FTND (3.11 ± 1.20), instrumental (2.21 ± 1) & LSCS (2.00 ± 1.17) with p value <0.001. The BISHOP score was lesser in the LSCS group which could be attributed to the fact the unripening of cervix. In our study all induction were done with bishops score <5. C Le Ray *et al.* 2007 in a study of induced labour with a BS of <5 reported the risk of cesarean delivery as higher than spontaneous labor while elective induction with favourable cervix did not increase the cesarean risk in nulliparous [6]. Thus in our study, bishops score 0 had 0% FTND and 3.6% of LSCS. Bishops score 1 had 8.2% of vaginal delivery and 36.4% of LSCS. Bishops score of 2 had 32.7% of vaginal delivery and 32.7% had LSCS. Bishops score of 3 had 24.5% of vaginal delivery and 14.5% of LSCS. Bishops score of 4 had 26.4% vaginal delivery and 9.4% LSCS. Bishop score of 5 had 8.2% vaginal delivery and 3.6% of LSCS.

In present study pre induction AFI was seen by ultrasonography. Phelan *et al.* have recommended that IOL to be considered in the patient with oligohydramnios (AFI < 5 cm) as it increases the risk of perinatal mortality and morbidity [7]. Madaan *et al.* suggested that oligohydramnios is a predictor of adverse perinatal outcome in terms of meconium staining, caesarean section for fetal distress, low apgar score [8]. In our study, the mean AFI in the patients undergoing LSCS was 10.63 cm, instrumental delivery was 10.63 cm and normal delivery was 11.36 cm. Patients with oligohydramnios undergoing induction (AFI ≤ 5 cm) were 9, out of which 8 patients underwent LSCS with most common indication being fetal distress and persistent non-reassuring cardiotocograph and 1 had instrumental delivery (forceps delivery) with the indication of fetal distress.

In our study mean time from induction to labour going into active phase who delivered by FTND is 6.80 hrs, for patients who delivered by LSCS is 8.18 hrs and for patients who delivered by instrumental delivery is 5.81 hrs. Significant difference was seen with ($p = 0.005$) in mean time from induction to labour going in active phase between LSCS and instrumental delivery. The longer it takes for labour to go into active labour more are the chances of going into failure. The mean time from induction to delivery for FTND is 12.38 hrs,

LSCS is 10.97 hrs and instrumental delivery is 11.55 hrs. When labour was found to be progressing in vaginal delivery, adequate time was given with close intrapartum monitoring.

Percentage of method of induction done in our study of 58% of foleys catheter induction, 23% of misoprostol, 13% of foleys with misoprostol and 6% of cerviprime. Method of induction was decided by consultant of unit according to bishop score and their protocol.

Various indications of induction of labour in our study out of which postdatism was commonest indication (48%), gestational hypertension (18%), oligohydramnios (13%), IUGR (9%), small for gestational age fetus, preeclampsia, GDM each 4%, prolonged latent phase and chronic hypertension each 1%. Study conducted in 2018, Sushil Chawla *et al.* suggested postdatism (35.8%), hypertension (17.3%), GDM (15.1%) are common indication of labour in there study [9] and other similar studies.

Amongst all those patients who were induced using Foleys catheter, majority were delivered vaginally either normal delivery (67.9%) or instrumental delivery (71.4%), however we didn't find any statistical significance when compared to LSCS. Induction with Foleys catheter in the study by Ning Gu, *et al.* showed similar findings where vaginal delivery was 79% with instrumental delivery 2.4% and caesarean section 17% [10]. Amongst those who delivered by LSCS, majority of indication was non-progress of labour followed by fetal distress. Foleys induction require oxytocin for augmentation (65% of a cases) as compared to other method of induction. In recent study by Lui J *et al.* results seem to support the use of oxytocin to a Foley catheter at the initiation of labor induction, as it might lead to increases the rate of delivery within 24 h in nulliparas [11].

In the study by Kyle Graham *et al.* the mean duration from induction to active phase was significantly shorter in the foleys with misoprostol when compared to the oral misoprostol alone group (771 min misoprostol with Foleys vs 922 min misoprostol, p value <0.01) The mean duration to second stage of labour was 985 min for misoprostol with Foleys catheter and 1080 min for oral misoprostol alone. There was no difference in induction-to-delivery time or mode of delivery [12]. Amongst those who delivered by LSCS, majority of indication was non-progress of labour and fetal distress. Amongst all those patients who were induced with Foleys followed by misoprostol method of induction, majority were delivered vaginally either normal delivery (10.7%) or instrumental delivery (4.8%), when compared to LSCS (47.3%).

Amongst all those patients who were induced with misoprostol alone was induced by oral route, with majority of cases were delivered by LSCS (27.3%) than FTND (17.9%) and instrumental delivery (19.0%). Misoprostol appears to be more effective than conventional methods of cervical ripening and labour induction. Although no differences in perinatal outcome were shown, the studies were not sufficiently large to exclude the possibility of uncommon serious adverse effects. Tove Wallstrom *et al.* concluded an orally administrated misoprostol is a good method of induction [13]. Orally given misoprostol is preferred by the delivering women and has a high rate of success and a low proportion of LSCS. Trishna Acharya *et al.* 2017 study suggested after induction with oral misoprostol, out of 205 cases, the rate of normal delivery was found to be 133 (64.9%), caesarean section 68 (33.2%) and vacuum delivery 4 (1.9%). The indication for LSCS in this study was fetal distress followed by non-progress of labour and failure of IOL [14]. If the time of labour can be shortened, the frequency of caesarean section decreased, which is contradicting to our study. Most common reason for caesarean section in misoprostol induction in our

study was fetal distress followed by non-progress of labour.

Amongst all cases in which method of induction cerviprime was used majority delivered by CS (21.8%) followed by instrumental (4.8%) and normal vaginal delivery (3.6%). Amongst the CS, most indication was severe fetal distress followed by non-progress of labour. In the study by Warkhe H S *et al.* suggest cerviprime to be effective method of induction with 17% of cases requiring LSCS with the most common indication being fetal distress [15].

Parkes *et al.*, using multivariate analysis, foetal indications for induction (including intra-uterine growth restriction, oligohydramnios, placental abruption, macrosomia and post-term pregnancy) were found to significantly increase the risk of caesarean delivery in nulliparous women [16]. The other significant factor was birth after week 40+0. In our study majority of indication for induction was postdatism, that is elective induction was done in 40 to 41 weeks, in which majority delivered vaginally (21.4%) or by instrumental (14.1%) then LSCS (16.4%). Hence it was concluded there was decrease in the incidence of caesarean section rate with elective induction at 40 weeks.

The term failed induction can be used specifically for caeseran sections that are done because of the latent phase has continued for the extended length of time and when it is unlikely to achieve active phase of labour or that vaginal delivery will be achieved [17]. The failure rate to induce labor was observed in 17 cases (16.3%) (not achieving active phase) was where cesarean was done in that induction group of patients of our study. The failure rate of labor induction was with cesarean delivery as an outcome. The predictors for adverse outcome were mainly the preinduction bishop score, indication for induction, method used for induction, oxytocin used or not. All the patients in the study had poor preinduction bishops (1 to 5) and were nulliparous patient. Majority of the patients who were induced for postdatism were 9, followed by gestational hypertension and oligohydramnios 3 patients each, other indication was IUGR and GDM 1 patient each. Patients were induced with misoprostol (11) followed by cerviprime (4) and foleys catheter (2). Out of 17 cases, 2 cases were augmented with oxytocin (following foleys induction and cerviprime induction). Indications for LSCS were failure of induction in 4 patients, non-progress of labour and non-progress with meconium stained liquor 4 and 2 patients respectively, fetal distress and category 3 intrapartum monitoring 3 patients each, cephalopelvic disproportion 1 patient.

In our study to depict, the perinatal mortality and morbidity was shown with NICU admission mostly in LSCS group (20%) and instrumental (19%) compare with FTND (10.7%) for respiratory distress followed by intubated fetus. Maternal complication found to be high in instrumental delivery (14.3%) in our study with most commonly postpartum hemorrhage and perineal tear. But there was no significant difference amongst FTND, LSCS and instrumental delivery. OY Abisowo *et al.* suggested maternal complications in induced patients in their study include primary postpartum hemorrhage and perineal lacerations. The study group had longer duration of hospital stay compared to the control ($P < 0.001$). Five perinatal mortality was noted amongst the study group compared to three in the control ($P = 0.848$). They concluded that the induction of labour has high risk of caesarean section and postpartum hemorrhage compared with patient going in spontaneous labour, however, overall rates remain low [18]. Women with Foley catheter induction, there were no differences in neonatal birth weight or neonatal admission according to Kyle *et al.* Elective induction of labour

in uncomplicated primigravida singleton pregnancy at 39 weeks' gestation is not associated with maternal or perinatal complications and may reduce the need for Caesarean section, risk of hypertensive disease of pregnancy and need for neonatal respiratory support or NICU admission.

Conclusion

- Induction of labour is the medical intervention done when continuing the pregnancy is not indicated and the benefits outweighs the risks for induction.
- To avoid the risks and increase its effectiveness careful assessment of the patients should be done to determine bishop score, gestational age, ultrasonography to determine estimated birth weight and amniotic fluid index, justified indication for induction and method of induction.
- Careful evaluation with individuating each case with giving adequate time to deliver with close intrapartum monitoring is needed.
- All the obstetric unit must audit the cases of failed induction and further attempts should be made for evaluating it for its shortcoming.

Limitations

- The present study was conducted with relatively small sample size and hence the findings cannot be generalized to the entire population. Thus, it warrants a need for study to be done with substantially larger sample size to make more generalized conclusions.
- Partogram could not be effectively used as the labour progression in induction of labour is different from spontaneous labour.

Conflict of Interest

Not available

Financial Support

Not available

References

1. Mercer BM. Induction of labour in the nulliparous gravida with an unfavorable cervix. *Obstet Gynecol.* 2005;105(4):705-09.
2. Misra M, Vavre S. Labour induction with intracervical prostaglandin gel and intravenous oxytocin in women with unfavorable cervix. *Aust NZJ Obstet Gynaecol.* 1994 Nov. Available from: <https://doi.org/10.1111/j.1479-828X.1994.tb01097.x>
3. Rayamajhi RT, *et al.* Indication for labour induction and predictors for failed induction at KMCTH.
4. Radoń-Pokracka M, Adrianowicz B, Płonka M, Danił P, Nowak M, Huras H. Evaluation of pregnancy outcomes at advanced maternal age. *Open Access Maced J Med Sci.* 2019 Jun 30;7(12):1951-1956. Available from: <https://doi.org/10.3889/oamjms.2019.587>
5. Divon MY, *et al.* Fetal and neonatal mortality in post term pregnancy - the impact of gestational age and fetal growth restriction. *Am J Obstet Gynecol.* 1998;178:726-731.
6. Le Ray C, *et al.* Elective induction of labor - risk of cesarean delivery. *Acta Obstet Gynecol Scand.* 2007;86(6):657-665.
7. Phelan JP, Smith CV, Broussard P, *et al.* Amniotic fluid volume assessment with four quadrant technique at 36–42 weeks of gestation. *J Reprod Med.* 1987;32:540–542.
8. Madaan S, Mendiratta SL, Jain PK, *et al.* Fetal Medicine:

- Research & Reviews. 2015;2:61. Available from: <https://doi.org/10.1007/s40556-015-0049-8>
9. Chawla S, Singh SK, Saraswat M, Vardhan S. Induction of labor: Our experience. *J Mar Med Soc.* 2017;19:96-98.
 10. Gun R, Wang Z, Dai Y, Zheng M, Xu B, *et al.* Foley catheter for induction of labor at term: an open-label, randomized controlled trial. *PLoS One.* 2015 Aug;10(8). doi: 10.1371/journal.pone.0136856.
 11. Liu J, Song G, Meng T, Ji L. Foley catheter with simultaneous oxytocin on labor induction: a meta-analysis of randomized controlled trials. *J Matern Fetal Neonatal Med.* 2019 Oct;32(19):3168-3175. doi: 10.1080/14767058.2018.1459551.
 12. Graham K, Nguyen M, Sit A, Morfin J, Garabedian M. Oral misoprostol versus combination of foley bulb catheter and oral misoprostol alone for induction of labor: A randomized controlled trial. *Am J Obstet Gynecol.* 2018 Jan;218(1).
 13. Wallström T, Järnbert-Pettersson H, Stenson D, Akerud H, Darj E, Gemzell-Danielsson K, Wiberg-Itzel E. Labor induction with orally administrated misoprostol: A retrospective cohort study. *Eur J Obstet Gynecol Reprod Biol.* 2017 Sep 18;218:142-147. doi: 10.1016/j.ejogrb.2017.09.011.
 14. Acharya T, Devkota R, Bhattarai B, Acharya R. Outcome of misoprostol and oxytocin in induction of labour. *Sage Open Med.* 2017 Apr 1;5:2050312117700809. doi: 10.1177/2050312117700809.
 15. Warke HS, Saraogi RM, Sanjwalla SM. Prostaglandin E2 gel in ripening of cervix in induction of labour. *J Postgrad Med.* 1999;45:105.
 16. Parkes I, Kabiri D, Hants Y, Ezra Y. The indication for induction of labor impacts the risk of cesarean delivery. *J Matern Fetal Neonatal Med.* 2016;29(2):224-228. doi: 10.3109/14767058.2014.993965.
 17. Rouse DJ, Owen J, Hauth JC. Criteria for failed labour induction: prospective evaluation of a standardized protocol. *Obstet Gynecol.* 2000;96:671.
 18. Abisowo OY, Oyinyechi AJ, Olusegun FA, Oyedokun OY, Motunrayo AF, Abimbola OT. Feto-maternal outcome of induced versus spontaneous labour in a Nigerian Tertiary Maternity unit. *Niger J Clin Pract.* 2017;34(1):21-27.

How to Cite This Article

Garude S, Nadkarni T, Chowdhary D, Dahiwade SU. Analysis of indications, methods, outcome of induction of labour in term nulliparous patient. *International Journal of Clinical Obstetrics and Gynaecology* 2024; 8(4): 01-06.

Creative Commons (CC) License

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.