

## Study of Elective Induction of Labour in Multiparous Women and Maternal Outcome

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**Abstract:** The present study involves study of elective induction of labor in 200 multiparous women and comparison of 1.induction to delivery interval, 2.duration of labour3. Mode of delivery 4.maternal complications with 200 control group of spontaneous delivery. The study results are analyzed and compared with studies of different authors Macer JA<sup>1</sup>, Prysak M<sup>2</sup>, Smith LP<sup>3</sup>, Hofmann MK<sup>4</sup>, Dubin et al<sup>5</sup>, Meghan rattigan study<sup>6</sup>. This study shows induction to delivery interval is greater in women without preinduction cervical ripening and shorter in women with preinduction cervical ripening group compared to spontaneous group.

Decreased cesarean delivery rate is seen in preinduction cervical ripening group, increased cesarean delivery rate is seen in without preinduction cervical ripening group compared to control group . Elective induction of labour is safe and effective method in order to prevent complications of post term pregnancy

**ABBREIVATIONS:** BS- bishop score PBS- preinduction bishop score BES- balloon expulsion spontaneously FTND- full term normal vaginal delivery NVD- normal vaginal delivery RMLE- right medio lateral episiotomy IDI- induction to delivery interval PPH-postpartum hemorrhage IUD- intrauterine death

### I. Introduction

Induction of labor is a common and essential element of the contemporary obstetric practice. It may be indicated, for medical maternal or fetal causes or induced without indication for the convenience of patient, obstetrician and relatives for the availability of other medical facilities. The later one is called elective induction of labour and its incidence is increasing rapidly at a greater pace than the medically indicated ones. It now accounts for approximately 20% of all deliveries, Representing a 140% increase since 1940<sup>7</sup>. The goal of labour induction is to achieve vaginal delivery by stimulating uterine contractions before the onset of spontaneous labour.

Elective induction of labour offers better planning by the obstetrician, patient and families and offers better intrapartum, postpartum care to mother and perinatal care to baby, thereby reducing maternal and perinatal mortality and morbidity. Induction of labour reduces the risk of complications in unfavorable conditions of pregnancy such as preeclampsia, oligohydromnios, fetal macrosomia, IUD etc.

Induction of labour is associated with increased incidence of caesarean delivery in both nulliparous and multiparous women<sup>8</sup>. multiparous women at term usually present with more favourable cervix. This study was undertaken to know the progress of labour in electively induced multiparous women with or without preinduction cervical ripening, and how it defers from progress in spontaneous labour and maternal outcome

### II. Aims And Objectives

1. To study the progress of labour in multiparous term pregnancies with and without preripening of cervix undergoing elective inductions and analyze and compare induction to delivery interval, mode of delivery and maternal complications.
2. To compare the labour progress in multiparous electively induced deliveries with spontaneous deliveries.
3. To assess the value and usefulness of elective induction in multiparous women

### III. Materials And Methods

The study population consists of 200 patients in elective induction group and 200 patients in the spontaneous group between 37 and 41 weeks of gestational age. Cases were defined as multiparous women with atleast one previous vaginal delivery.

200 cases and 200 controls were selected after thorough clinical examination , recording of vitals- temperature, cardiovascular system, respiratory system, per abdomen, and per vaginal examination, ultrasound and other necessary investigations.

STUDY DESIGN: Prospective observational study between September 2013 to September 2014, Govt

maternity hospital, Tirupathi.

**INCLUSION CRITERIA:**

Multiparous women from 37 to 41 weeks of gestational age with Singleton pregnancy, Vertex presentation, adequate pelvis.

**EXCLUSION CRITERIA:**

Women with gestational hypertension, diabetes, other medical problems, previous cesarean delivery, multiple gestation, abnormal presentation, IUD, IUGR, oligohydromnios. After taking informed consent from the patient, detailed history was taken, general, systemic, per abdominal, pervaginal examination were done. 200 Multiparous women with spontaneous onset of labor was control group A., 100 induced patients with Bishop score less than 6 is – GROUP B and 100 patients with bishop score more than 6 is group C. Induction of labour in group B was done with Foley’s catheter no. 14. After spontaneous expulsion of Foley catheter, bishop score was assessed again, i. v 2.5units oxytocin in 1 point of normal saline was started at 10 drops per minute and increased in escalation doses till delivery. In group C labor was induced with 2.5 unit’s oxytocin in 1 point of normal saline at rate of 10 drops per min directly.

Both groups were assessed by using parameters such as preinduction bishop score (PBS), bishop score (BS) after balloon expulsion spontaneously (BES), induction to delivery interval, mode of delivery, maternal complications. Results were analyzed by using chi square test, kruskal wallis test

**IV. Results**

**TABLE 1 AGE DISTRIBUTION**

AGE( years)	GROUP A n(%)	GROUP B n (%)	GROUP C (N%)
20-24	120(60)	60(60)	52(52)
25-29	70(35)	31(31)	42(42)
30-34	10(5)	9(9)	6(6)

**TABLE 2: PARITY:**

PARITY	GROUP A (n%)	GROUP B (n%)	GROUP C (n%)
1	139(70)	69(69)	76(76)
2	54(27)	28(28)	23(23)
3	7(3)	3(3)	1(1)

**Table 3 Bishop Score After Catheter Expulsion Spontaneously In Group B**

BS AFTER BES	NO OF CASES	PERCENTAGE
6	24	24
7	18	18
8	33	33
9	20	20
10	4	4
11	1	1

**Table 4: Induction To Delivery Interval**

GROUP	Median	Mean+SD	P value, Sig	Significant pairs
GROUP A	11.0	11.1+2.7	< 0.001	A&B, B&C, A&C
GROUP B	13.4	16.5+10.9		
GROUP C	7.3	8.6+4.4		

**TABLE 5: MODE OF DELIVERY**

MODE OF DELIVERY	GROUP A (n%)	GROUP B (n%)	GROUP C (n%)
FTND	74(37)	62(62)	53(53)
FTND+RMLE	111(55.5)	34(34)	37(37)
OUTLET FORCEPS	10(5)	2(2)	6(6)
LSCS	5(2.5)	2(2)	4(4)

**TABLE 6: MATERNAL COMPLICATIONS**

MATERNAL COMPLICATIONS	GROUP A (n%)	GROUP B(n%)	GROUP C(n%)
Third degree perineal tear	3(1.5)	1(1)	2(2)
Complete perineal tear	-	-	-
Chorio amnionitis	2(1)	1(1)	-
endomyometritis	-	-	-
PPH	4(2)	2(2)	1(1)
Atonic bladder	2(1)	1(1)	-
Vaginal laceration	11(5.5)	3(3)	2(2)

## V. Discussion

This study was conducted in government maternity hospital, Tirupati who fulfilled the inclusion criteria for the present study. This study was compared with other authors who have done the same procedure. The purpose of study was to measure the effects of labor induction in a homogeneous cohort of women and in whom the only complication was prolonged pregnancy but, induction and labor management were uniform.

Present study was done to know the progress of labor and maternal outcome in electively induced multiparous women and how it differs from spontaneous labor. In present study 200 term multiparous women in spontaneous labor taken as control group- A. 100 term multiparous women with bishop score less than 6 was taken as group B, and 100 term multiparous women with bishop score more than 6 was taken as group C and they were electively induced. Group B underwent cervical ripening with Foleys catheter followed by oxytocin drip under cover of antibiotics. Group C underwent induction of labor with oxytocin directly.

### Age distribution in present study:

60% of cases and 56% of controls are between 20 and 24 . 35% of cases and 36.5% of controls are between 25-29 years of age. 7.5% of controls and 5% of cases are between 30-35 years of age. Advanced maternal age also increases the incidence of cesarean rate in both controls and cases. So age distribution in present study doesn't affect the outcome of present study. Majority of controls and cases are between 20-24 years of age which doesn't specifically influence incidence of cesarean section.

### Para distribution in present study

55% of controls and 56% of cases are Para 1. 37% of controls and 34% of cases are Para 2. 74% of controls and 10% of cases are Para 3. Parity in distribution among controls and cases are almost similar .In majority of multiparous women preinduction cervical ripening was less than 6. In group B after spontaneous expulsion of Foleys catheter bishop score was more than 8.indicating influence of Foleys induction.

In study conducted by Harper, Lorie M<sup>9</sup> and colleagues to compare labour progress in induced women with that of women with spontaneous labour group, median time to progress 1 cm dilation in active labor was similar in induced and spontaneous group where as the time to progress 1 cm in latent labor was longer in women who were induced compared with spontaneous group.

**Results of the study were discussed under following categories:**

1. Induction to delivery interval.
2. Duration of labor
3. Mode of delivery
4. Maternal complications.

**Induction to delivery interval:**

Mean time Of delivery interval in 200 cases of multiparous women in spontaneous labor group was 11.1 hours, mean time for induction to delivery in 100 cases of multiparous women in elective induction without cervical ripening group B was 16.5 hours and where as in group C (with cervical ripening) was 8.6 hours.

Authors	GROUP	NO. OF CASES	MEAN DURATION OF LABOR IN HOURS
SMITH LP(1984)	Study	323	6.1
	Control	1,843	7.6
MACER JA(1992)	Study	253	6.00
	Control	253	6.66
PRYSAK M(1998)	Study	461	6.2
	Control	461	6.2
PRESENT STUDY	Elective induction without preinduction cervical ripening	100	6.02
	Elective induction with preinduction cervical ripening	100	7.54
	Control	200	7.8

Friedman and Friedman and sachtleben<sup>10</sup> examined patients undergoing induction of labor separately from spontaneous labor patients. They found a foreshortening of all phases of labor. Lorie M. Harper and colleagues from 2004-2008 conducted a study to compare progress of labor in induced group with that of spontaneous group. After adjusting race, obesity, macrosomia and bishop score, women who were induced had a significantly longer duration of labor than women of spontaneous labour group ( median in hours for multiparous women 4.4 in induced compared with 2.4 in spontaneous ), but the active phase of labor is same in both groups. In the present study, mean duration of labor, in induced group was shorter than in women with spontaneous labour. But, the induction to delivery interval was increased in induced group without preinduction cervical ripening and in those with favorable bishop score, induced with oxytocin; induction to delivery interval is decreased. This finding is clinically significant. Active phase to delivery interval was decreased in both groups.

A prior study by Rinehart et al<sup>11</sup> suggested that women who were induced had prolonged labor than in women with spontaneous labor. However, this study was inconclusive due to lack of contemporary control group of spontaneous labor. The induction cohort was compared with the historical cohort from Friedman et al, a greater than 45 years difference between these cohorts makes them relatively incomparable as a result of differences in the patient population and in the management of labor.

**Mode of delivery**

In the present study of 400 women, among control group 97.5% vaginal delivery ( 92.5% of women had normal vaginal delivery and 5% had outlet forceps delivery) and 2.5% had cesarean delivery. 2 cases of outlet forceps were done for failed maternal forces and 8 for fetal distress. 4 cases of LSCS were done for obstructed labor and 1 case for cord prolapse. Among the elective induction without preinduction cervical ripening group 96% had vaginal delivery ( 90% normal vaginal and 6% outlet forceps)4% had cesarean delivery. 2 cases of outlet forceps were done for failed maternal forces and 4 for fetal distress. 2 cases of cesarean delivery were done for fetal distress, 1 for failed induction, 1 for delayed progress. In case of failed induction no of hours observed was 28 hours. Among the elective induction with preinduction cervical ripening group 98% had vaginal delivery ( 96% vaginal and 2% had outlet forceps delivery), 2% had cesarean delivery, 2 cases of outlet delivery were done for fetal distress , one cases of LSCS were done for fetal distress and another for failed induction. The no. of hours observed in failed induction case was 22 hours

Authors	Groups	No. of cases	Vaginal delivery	Assisted vaginal delivery	Rate of LSCS
Macer JA	Study	253	57.7%	27.7%	14.6%
	Control	253	68%	20.9%	11.1%
Prysak M	Study	461	91.3%	-	8.7%
	Control	461	95%	-	5%
Smith LP	Study	323	98.2%	-	1.8%
	Control	1843	98.3%	-	1.7%
Hofmann MK	Electively induced with preinduction cervical ripening	61	83.6%	13.1%	1.6%
	Without preinduction cervical ripening	735	90.4%	5.6%	3.9%
	Control	1885	91.7%	5.5%	2.3%
Present study	Induced with pre induction cervical ripening	100	96%	2%	2%
	Without preinduction cervical ripening	100	90%	6%	4%
	Control	200	92.5%	5%	2.5%

In the present study, both operative vaginal delivery rate and cesarean rate are increased in women without pre induction cervical ripening compared to women with spontaneous labor. But it is decreased in women with preinduction cervical ripening compared to those with spontaneous labour. As, a whole, both operative vaginal delivery and cesarean delivery are lower in induced group compared to control group.. Overall operative vaginal delivery is lower, and cesarean delivery rate is increased in induced group (3%) compared to spontaneously labored group (2.5%) is slightly increased.

In case Of study conducted by Hoffman et al, operative vaginal delivery rate, and cesarean rate are higher in women electively induced with and without preinduction cervical ripening compared to control group.

In the present study, vaginal delivery rate and LSCS rate are consistent with that of Smith LP, Macer JA, Prysak

M who used the same study protocol.

A review in 2006 by Sanchez- Ramos<sup>12</sup> and colleagues concluded that labor induction at 41 weeks gestation for otherwise uncomplicated singleton pregnancies reduces cesarean delivery rates without compromising maternal and perinatal outcomes.

In a systematic review conducted by Caughey et al<sup>13</sup> and colleagues in 2009 on elective induction of labor versus expectant management of pregnancy revealed 20% reduction in the rate of cesarean delivery and 50% reduction in the presence of meconium in the amniotic fluid.

In 1998, Prysak et al and in 2011, Osmundson<sup>14</sup> reported on elective induction of labor versus spontaneous labor at term. Neither group found a significant difference in rate of operative vaginal delivery.

### **Maternal complications**

In present study, there were 2 cases of fever in control group and 1 in induced group with pre induction cervical ripening. Fever was due to chorioamnionitis. Macer JA Study reported maternal complications 4% and 6% in the study and control group respectively. There were 2.5% vaginal laceration in the study, 5.5% control group in the present study and no cases of endomyometritis. Incidence of vaginal lacerations in literature is 6% and 7% in the study and control group respectively. In present study, percentage of vaginal laceration in control group was higher than induced group. Percentage of third degree perineal tear was similar in both groups. There were 4 cases of PPH in control group, 2 cases in induced group with pre induction cervical ripening and 1 case in induced group without preinduction cervical ripening. Atonicity of bladder was noticed in 2 cases of control group and in 1 case of induced group with preinduction cervical ripening. Thus , overall maternal complications are same or even less in electively induced group compared to control group.

One RCT and three observational studies evaluated the association between elective induction and PPH and found no association.

## **VI. Conclusion**

This study on elective induction of labor in multiparous women is to assess the pattern of labor in women with and without preinduction cervical ripening and its comparison with normal labour. In this study Foley catheter induction resulted in greater change in bishop score in women with unfavorable cervix. Induction to delivery interval is shorter in pre induction cervical ripening group compared to spontaneous group. Induction to delivery interval is significantly longer in induced group without preinduction cervical ripening group compared to spontaneous group. Electively induced women with preinduction cervical ripening had decreased cesarean delivery rate, operative vaginal delivery and in those without preinduction cervical ripening had increased operative vaginal delivery rate, cesarean rate compared to spontaneous group. Overall cesarean delivery rate in induced group is slightly greater than in spontaneous group. Elective induction of labor in multiparous women is safe and effective method in order to prevent complications of post term pregnancy.

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