IJMRP

Original Research Article.

A Comprehensive Profile of Labour Inductions in Semi Urban Area: A Hospital Based Prospective Study

Ravindra Sankhala

Senior Specialist (Department of Obstetrics & Gynaecology),
Shri Jawahar Government District Hospital, Jaisalamer, Rajasthan, India.

ABSTRACT

Background: The comprehensive guidelines of this prospective project is approach based with simple measures to study the labor inductions covering the characteristics of the population group, indications for induction, methods and protocols for induction, outcome of labor with the boons and bans of induction for the mother and the fetus evoluting.

Material & Methods: This comprehensive study on Induction of Labor on 200 pregnant woman was carried out at Shri Jawahar Government District Hospital, Jaisalamer, Rajasthan. Due to the different experiences of the consultants, with varied indications for induction, with different protocols in a private practice with a lot of consideration and dialogue with patients, this study is actualized to see the comprehensive profile of labor induction with its pros and cons to the modern day pregnant woman in an urban setting.

Results: The incidence for induction of this study is 23.8% from which 18% (76/420) is for clinical indications while 5.7% (24/420) are for logistic inductions. The relative risk for bishop score < 6 with instrumental delivery is 1.01 and O.R is 1.02 while for cesarean delivery The R.R is 3.7 and O.R is 4.3 at 95% of confidence interval. This signifies that <6 bishop score can be an independent predictor for instrumental and cesarean deliveries in labor induction.

Conclusion: We concluded that labor induction appears to be a safe alternative to spontaneous labor with the success rate of 96 % to induce and 88% to deliver with no mortality and minimum morbidity for this study in clinically indicated cases to safeguard the mother and neonate, with precautions and evidence based protocols to identify the risks and challenges to initate the natural labor process.

Keywords: Labor Induction, Bishop Score, Fetal Outcome, Maternal Outcome.

INTRODUCTION

Labor induction is a clinical intervention that has the potential to confer major benefits to the mother and newborn when continuation of pregnancy poses a risk or danger to the outcome of pregnancy. Thus induction of labor has become a common obstetric practice referring to the process of labor where the uterine contractions are initiated by medical and surgical means before the onset of spontaneous labor.[1]

Also Induction of Labor is a non-spontaneous initiation of uterine contractions that results in progressive dilatation with effacement of cervix and descent of the presenting part of fetus, culminating in safe vaginal delivery of the baby, after 28 weeks of gestation, with a good outcome. It is initiating the process of labor by artificial means.[2]

In current obstetric practice, induction of labor is often carried out for various maternal, fetal, or logistic reasons. Induction of labor is the artificial initiation of uterine contractions prior to their spontaneous onset with natural, mechanical or medical drugs leading to progressive dilatation and effacement of the cervix culminating in the process of birthing. The comprehensive guidelines of this prospective project is approach based with simple measures to study the labor inductions covering the characteristics of the population group, indications for induction, methods and protocols for induction, outcome of labor with the boons and bans of induction for the mother and the fetus evoluting.

MATERIALS & METHODS

This comprehensive study on Induction of Labor on 200 pregnant woman was carried out at Shri Jawahar Government Distric Hospital, Jaisalamer, Rajasthan.

Group I: 100 cases were studied for Induction of Labor in those pregnant woman admitted with the indications for Induction of labor and followed up to their deliveries and through their hospital stay.

Group II: 100 cases were studied as Control in those pregnant women who were admitted in spontaneous labor and followed up to the outcome of pregnancy till their discharge from the department.

Inclusion Criteria

➢ All inductions after 28 weeks
➢ Medical disorders- hypertension and diabetes, Rhesus isoimmunisation
➢ Oligohydramnios, Postdated, Suspected macrosomia,
➢ Prelabor premature rupture of membranes (PROM)
➢ Intra uterine growth retardation (IUGR), Non reassuring non stress Test
➢ Elective reasons- Social/ Convenience

Exclusion Criteria

➢ Less than 28 weeks gestational age
➢ Previous cesarean section/ Hysterotomy, Cephalopelvic disproportion
➢ Ante partum hemorrhage, Pelvic tumors, Herpes genitalis infections
➢ Malpositions, Severe Intra uterine growth retardation (IUGR).
➢ Congenital malformations/ Intra uterine death (IUD)

Due to the different experiences of the consultants, with varied indications for induction, with different protocols in a private practice with a lot of consideration and dialogue with patients, this study is actualized to see the comprehensive profile of labor induction with its pros and cons to the modern day pregnant woman in an urban setting. This study has analyzed all the aspects of labor induction in an urban hospital catering to the much affluent.

RESULTS

Our study showed that the mean maternal age for the induction group is 27.3 years and 25.9 years In control group. Mean gestational age in weeks 38.5 weeks & 38.4 weeks in both groups respectively, the mean body mass index for the induction group was 23.9 with a mean weight gain of 11.9 kgs as compared to the control group which has a BMI of 24.8 with a mean weight gain of 11.6 kgs. The induction group and the control group are similar in population descriptive characteristics (table 1).

The incidence for induction of this study is 23.8% from which 18% (76/420) is for clinical indications while 5.7% (24/420) are for logistic inductions (table 2).

Table 1: Descriptive analysis of the study population for induction and the control belonging to Group I and Group II.

Variables	N	Induction	Control	Induction	Control	Induction	Control	Induction	Control
		Mean		Std. Deviation		Minimum		Maximum	
AGE (yrs)	100	27.3	25.9	3.5	3.9	20	19	39	37
ML (yrs)	100	2.7	2.1	2.2	1.3	1	1	13	5
Ht (cms)	100	153.3	152.9	2.0	2.1	150	148	164	160
PREPREG (kg)	100	56.2	58.1	4.4	4.9	48	45	71	72
Wt gain (Kg)	100	11.9	11.6	3.2	2.5	6	6	22	19
BMI	100	23.9	24.8	1.7	1.9	20.5	19.9	29.94	29.6
GA (wks)	100	38.5	38.4	1.5	1.2	34	33	41.4	40.6

Table 2: Correlation of indication of induction with method of Induction and parity.

| | Primi | | | | | | Multi | | | | | | |
	oxy	pge2	Oxy + pge2	Oxy + pge2 + arm	Oxy + arm	Oxy + miso + arm	oxy	pge2	Oxy + pge2	Oxy + pge2 + arm	Oxy + arm	Oxy + miso + arm	Total
GDM on diet	1	3	3	4	0	0	0	1	2	2	0	0	16
GDM on insulin	0	0	3	1	0	0	0	0	1	1	1	0	7
PIH	0	4	3	1	1	0	0	0	0	0	0	0	9
Post dated	0	0	4	0	1	0	0	0	0	0	1	0	6
Oligohydramnios	0	1	1	0	0	1	0	0	0	1	0	0	4
PROM > 12 hrs	6	0	2	0	0	1	2	0	0	0	0	1	12
Macrosomia	1	0	1	1	0	0	0	0	2	0	2	1	8
Irritable Uterus	0	0	1	2	0	0	1	0	2	0	1	0	7
On EDD	0	1	5	0	1	0	0	1	1	0	0	0	9
Elective	1	1	0	2	1	0	0	0	2	1	0	0	8
IUGR	1	1	0	2	1	0	0	0	0	0	1	0	6
GDM, PIH	0	0	1	2	1	0	0	0	1	1	0	0	6
Others	0	0	1	1	0	0	0	0	0	0	0	0	2
Total	10	11	25	16	6	2	3	2	11	6	6	2	100

Table 3: Distribution of maternal age with mean of total duration of labor in Group I induction and Group II control.

Maternal age (yrs)		< 10 hrs			11 - 20 hrs			20 - 30 hrs		
		N	Mean	SD	N	Mean	SD	N	Mean	SD
< 35	Induction	89	6.6	1.5	3	13.1	1.9	0	0	0
	Control	46	7.4	2.8	42	13.7	2.3	10	26.9	2.7
	Total	135	6.9	2.1	45	13.6	2.3	10	26.9	2.7
> 36	Induction	2	7.1	0.06	0	0	0	0	0	0
	Control	0	0	0	2	13.2	2.6	0	0	0
	Total	2	7.1	0.06	2	13.2	2.6	0	0	0

Table 4: Progression of labor in all stages for both the groups in correlation with parity including the mean, standard deviation, minimum and maximum values.

Stages of labor	Induction				Control				Anova	Sig / Not Sig
	Mean	SD	Min	Max	Mean	SD	Min	Max		
Latent (hrs)	3.2	1.3	0.3	7.15	7.9	4.5	1.49	23	0.000	Sig
Active (hrs)	3.02	1.3	1.2	7.3	4.5	2.5	1.05	14.3	0.000	Sig
II stage (min)	17.5	12.8	4	61	18.9	13.1	2	60	0.440	Not Sig
III stage (min)	5.4	1.5	3	10	7.2	7.5	3	80	0.022	Sig
Rate of cervical dilation(cm/hr)	2.3	1.1	0.75	5.8	1.9	1.2	0.49	6.67	0.032	Sig
Total (hr)	6.3	2	0.3	14.45	15	6.4	5	35	0.000	Sig

The duration of labor in the <35 subgroup for 10 hrs is seen for the majority of the 89 cases with a mean of 6.6 hrs in the induction group as compared to the 88 cases who delivered by 20 hrs with a mean of 7.4 and13.7 in the expectant management group. This signifies that the induction group has been helped with the inducers with regards to lesser duration of labor when compared to the control group (table 3).

Group I for induction has a mean latent phase of 3.2 hrs with a maximum of 7.15 hrs as compared to the control group with a mean of 7.9 hrs, maximum of 23 hrs and showing the p value of 0.000 significant. The induction group has a mean active phase of 3.02 hrs with a maximum of 7.3 hrs as compared to the control group with a mean of 4.5hrs, maximum of 14.3 hrs and showing the p value of 0.000 significant.

The rate of cervical dilatation in the active phase shows a mean in the induction group of 2.3cm/hr with a minimum of 0.75 cm/hr as compared to the control group with a mean of 1.9 cm/hr showing the probability value of 0.032 as significant for this study. The total duration of labor in group I show a mean of 6.3 hrs as compared to the control group with a mean of 15 hrs showing the p value of 0.000 as significant (table 4).

In both the Groups I and II of the study, the maternal age divided into two subgroups of <35 years showed 49 and 80 normal deliveries respectively as compared to the subgroup of >36 years showing 1 and 2 normal deliveries respectively. The Instrumental deliveries in the subgroup <35 years of maternal age are 37 for induction group and 15 for the control group. Cesarean section is also seen in both the groups as 12 for the induction group and 3 for the control (table 5).

The relative risk for bishop score < 6 with instrumental delivery is 1.01 and O.R is 1.02 while for cesarean delivery The R.R is 3.7 and O.R is 4.3 at 95% of confidence interval. This signifies that <6 bishop score can be an independent predictor for instrumental and cesarean deliveries in labor induction (table 6).

Table 5: Distribution of maternal age with regard to mode of delivery in both groups

Group	Age	Normal	Instrumental	LSCS	Total
Induction	< 35	49	37	12	98
	> 36	1	1	0	2
Control	< 35	80	15	3	98
	> 36	2	0	0	2
Total		132	53	15	200

Table 6: Distribution of gestational age in weeks and bishop score with regard to mode of delivery in group I.

Gestation age (weeks)	B.S< 6			> 6 B.S			
	Normal	Instrumental	LSCS	Normal	Instrumental	LSCS	Total
32-36	3	3	2	0	2	0	10
37-38	13	8	6	8	4	0	39
39-40	17	18	4	7	3	0	49
>40	2	0	0	0	0	0	2
Total	35	29	12	15	9	0	100

DISCUSSION

Our study showed that the benefits of labor induction are weighed against the potential maternal and fetal risks associated with continuing pregnancy in 76% of cases. When the benefits of expeditious delivery are greater than the risks of continuing the pregnancy, inducing labor can be justified as a therapeutic intervention for this group but 24% are for the elective / logistic reasons of the patient.

The factors explaining the majority of the observed rate of induction are well-recognized and clinically plausible indications. Gestational Diabetes[3], preeclampsia, abnormal liquor volumes, (polyhydramnios/oligohydramnios) are associated with perinatal morbidity and mortality, and its association with labor induction is almost certainly a reflection of the clinical management of these diseases to improve outcomes.[4] The use of induction in the management of PROM and prolonged pregnancy is supported by the evidence-based national clinical guidelines as it has been found to reduce the incidence of perinatal morbidity and mortality.[5]

This current study also suggests that obstetricians used induction of labor as therapeutic interventions to reduce the risk of complications to mother and fetus by accelerating the delivery process and proving the good old saying "Prevention is better than complication".

Elective induction of labor is defined as induction of labor in the absence of a medical or obstetric indication for termination of pregnancy. There is considerable disagreement with regard to the advantages and disadvantages of this obstetric indication. Induction is sometimes performed for "social" or "geographic" reasons, without a medical or obstetric indication. The American College of Obstetricians and gynaecologists suggests that labour may be induced for logistic reasons, including risk of rapid labour, distance from hospital, and psychosocial reasons. Raybum WF et al 2002 estimated that nationwide 10% of all deliveries are elective inductions.[6]

In this present study the clinically indications for induction rate was 18.09% and the logistic induction rate was 5.7%. The primary key to a successful induction of labor is proper patient selection. Although it is not possible to predict precisely the likelihood that an induction will succeed or fail, several factors favour successful vaginal delivery. These factors include: a favourable Bishop Score, gestational age and parity. When selecting patients, consideration must be given to several interdependent factors: maternal age, married years, height, prepregnant weight, body mass index, weight gain during pregnancy which could modify the response to inducers.

In the present study, the induction group's mean maternal age is 27.3 yrs which is more than the control group having a mean of 25.9 yrs. There are few mothers above 35 years in the study groups which either indicates the low parity status with a two children family norm or the possibility of them delivering by cesarean deliveries due to the associated complications. Thus excluding the extremes of teenage and elderly primigravidas, maternal age is an independent predictor of labor induction success affecting the duration of labor and mode of delivery.

The present study when compared to another study of Victor M Allen et al 2005[7] shows the geographical variations of the pregnant mother. Victor M Allen compared the induction mothers to those who went into spontaneous labor with the above features and inferred that maternal age for induction is more likely younger.

Like other obstetric interventions, Kiran UTS et al, 2005 found a disproportionate rate of labor induction among pregnant women with a BMI >35 adding to the growing body of evidence that suggests that obese women are at increased risk of obstetric intervention.[8]

Aaron B Caughey et al 2006 proved that women undergoing induction with increasing gestation have an increased cesarean delivery rate when compared to spontaneous group.[9]

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 nulliparas.[10] Macer JA and his colleagues reported that the BS did not affect the CS rate for multiparous women but nulliparous women with a BS <5 had higher Cesarean section rate than those with BS > 5(50% compared with 26%).[11] Vrouenraets et al found nulliparous women undergoing labor induction at term to have a 2.2-fold higher risk of cesarean delivery than those presenting in spontaneous labor. Although maternal age of 30 years or more, body mass index of more than 31 kg/cm^2, fetal weight of 3,500 g or more, and the need for epidural anaesthesia were all associated with an increased risk of cesarean delivery, an unfavourable cervix (Bishop score < 5) was the predominant risk factor (adjusted risk ratio 2.32).[12]

Induction of labour can place more strain on labour wards than spontaneous labour. Traditionally, induction is carried out during the daytime when labour wards are often already busy. Bishop score at induction and parity are important factors in contribution to the method of induction influencing the mean induction to onset of labor, induction to active phase and induction to delivery interval.

Rouse DJ et al 2000 attempted to define a failed induction with an outcomes-based approach by examining the association of the length of latent phase during labor induction with the frequency of cesarean and maternal and neonatal morbidity, and determined that "benefit to continued induction" accrues for as long as 12 hours in the latent phase; after which the frequency of vaginal delivery is dropped to 13%.[13]

CONCLUSION

We concluded that labor induction appears to be a safe alternative to spontaneous labor with the success rate of 96 % to induce and 88% to deliver with no mortality and minimum morbidity for this study in clinically indicated cases to safeguard the mother and neonate, with precautions and evidence based protocols to identify the risks and challenges to initiate the natural labor process. The goal of labor induction to ensure the best possible outcome for mother and newborn is 88% uneventful vaginal deliveries with minimum morbidity or no mortality in this study.

REFERENCES

1. Norwitz E., J. Robison and J. Repke, "Labor and delivery in Gabbe SG, Niebyl JR, Simpson JL, eds. Obstetrics: normal and problem pregnancies. 4Th ed., New York: Churchill Livinsstone; 353-94, 2002.
2. S.I. Kayanil, Z. Alfiveric, Induction of labour with previous caesarean delivery: where do we stand? Current Opinion Obstetrics and Gynecology, (2006); 18:636-41.

3. S. Bhattacharya and D. Campbell, The incidence of severe complications of pre-eclampsia, Hypertension in Pregnancy, (2005); 24:181–90.

4. J.M. Roberts, G. Pearson, J. Cutler, et al. Summary of the NHLBI working group on research on hypertension during pregnancy. Hypertension, (2003); 41:437–45.

5. M.E. Hannah, A. Ohlsson, D. Farine, et al., Induction of labor compared with expectant management for prelabor rupture of membranes at term, North England Journal Medicine, (1996) 334:1005–10.

6. Rayburn WF, Zhang J. Rising rates of labor induction: present concerns and future strategies. Obstetrics Gynecology (2002); 100:164–7.

7. Victoria M Allen et al. Economic implications of method of delivery. American Journal Obstetric Gynecology (2005); vol. 193:192-7.

8. Kiran UTS, Hemmadi S, Bethel J, et al. Outcome of pregnancy in a woman with an increased body mass index. British Journal Obstetrics Gynaecology. (2005) 112:768–72.

9. Aaron B Caughey et al: Induction of labor and cesarean delivery by gestational age, American Journal Obstetric Gynecology (2006); 195: 700-5

10. C Le Ray et al. Elective induction of labor- risk of cesarean delivery. Acta Obstetrica et gynaecologica Scandinavia (Issue 6, 2007), 86:657-665.

11. J. A. Macer, C.L. Macer, and L.S. Chan, Elective induction versus spontaneous labor: a retrospective study of complications and outcome, American Journal Obstetrics Gynecology, (1992); 166:1690-7.

12. Vrouenraets FPJM, Roumen FJME et al. Bishop score and risk of cesarean delivery after induction of labor in nulliparous women. Obstetrics Gynecology (2005);105:690 –7.

13. D. J. Rouse, Owen J, Hauth JC. Criteria for failed labor induction: prospective evaluation of a standardized protocol. Obstetrics Gynecology, (2000); 96:671–7.