Advances in Bioresearch
Adv. Biores., Vol 8 (2) March 2017:159-163
©2017 Society of Education, India
Print ISSN 0976-4585; Online ISSN 2277-1573
Journal's URL:http://www.soeagra.com/abr.html
CODEN: ABRDC3
DOI: 10.15515/abr.0976-4585.8.2.159163

Advances in Bioresearch

ORIGINAL ARTICLE

Comparative Study between Elective Induction of Labour and Spontaneous Labour

P. Sujata[1] and Kabita Chanania[1*], Jagdish Hansa[2]
[1]Department of Obstetrics and Gynaecology, IMS and SUM Hospital, Siksha O Anusandhan University, K 8, Kalinga Nagar, Bhubaneswar -751003, Odisha, Bhubaneswar.
[2] Directorate of medical research & life sciences, IMS & SUM Hospital, , Siksha O Anusandhan University, K 8, Kalinga Nagar, Bhubaneswar -751003, Odisha, Bhubaneswar
*Corresponding Author's Email ID- kavygyn@gmail.com

ABSTRACT
Induction is one of the most common obstetric procedures performed in the world. There has been an increase in the rate of medically and obstetrically indicated indications, as well as an increase in the rate of elective inductions. A total of two hundred patients attending the labour room of obstetrics and gynaecology department of the IMS & SUM Hospital, Bhubaneswar from 1st January2014 to 31st December 2014 were included in the present prospective study. A total of 100 cases were taken as case study group and 100 cases were taken as controls. Mean age in Group A and Group B was 26.02 ± 3.81 years and 25.38 ± 4.65 years respectively. Women in spontaneous group have higher chances of spontaneous vaginal delivery than in induced labour group. The rate of primary caesarean sections in control group was 56% in Group A whereas it was 21% in Group-B. Mean 1 minute Apgar score was 8.46± 0.66 in Group-A and 8.27± 0.85 in Group B. Prostaglandins are given as cervical ripening agents to women for achieving a favorable cervical status. They can often initiate labor in some women eliminating the need for oxytocin. They are not generally used for induction in women with a favorable cervix because their action in favorable cervices is not well understood. We can conclude from the present study that while induced labor may increase the chances of caesarean section, it does not adversely affect the neonatal outcome.
***Key words**:- Induction, effacement, spontaneous labor, Oxytocin, APGAR, Prostaglandins, caesarean section.*

Received 31/12/2016 Revised 11/01/2017 Accepted 08/02/2017

How to cite this article:
P. Sujata and Kabita Chanania, Jagdish Hansa. Comparative Study between Elective Induction of Labour and Spontaneous Labour. Adv. Biores., Vol 8 [2] March 2017: 159-163.

INTRODUCTION

Induction is one of the most common obstetric procedures performed in the world. In the US alone the rate has increased from 9.5 % to 22.8% between 1990 and 2012 [1,2]. There has been an increase in the rate of medically and obstetrically indicated indications, as well as an increase in the rate of elective inductions. Induction of labor is performed for a myriad of indications, but if elective induction is undertaken certain criteria for term gestation should be met. These criteria include a gestational age of 39 weeks or greater, documentation of 30 weeks of fetal heart tones by Doppler ultrasonography or passage of 36 weeks since a positive serum or urine human chorionic gonadotrophin pregnancy test [2]. There are certain risks associated with induction of labor like prolonged labor, caesarean delivery, postpartum haemorrhage, uterine contractile and fetal heart rate abnormalities, chorioamnionitis and possible birth trauma. Success of induction of labor varies widely and depends on some modifiable and nonmodifiable factors like maternal age, habits, obstetric history, gestational age and cervical status at the onset of induction. In this study we used modified Bishop's scoring system for assessment of the cervical status prior to induction. The score incorporates five factors which include cervical dilatation, effacement, station, consistency, and position [3]. Recent literature has recommended the use of a simpler version using only three of the original five factors [4]. This simplified version has been shown to have a similar or better predictive value and positive likelihood ratio as compared with the conventional modified

Bishop scoring system. Since induction of labor has its own advantages and disadvantages, our study was undertaken to compare the maternal and fetal outcome in induced labor with PGE_2 gel. Introduction of prostaglandin in the field of induction opened a new chapter. PGE_2 gel has greatly revolutionized the method of induction of labor.

MATERIAL AND METHODS

A total of two hundred patients attending the labour room of obstetrics and gynecology department of the IMS & SUM Hospital, Bhubaneswar from 1st January2014 to 31st December 2014 were included in the present prospective study. A total of 100 cases were taken as case study group and 100 cases were taken as controls. Control women were selected for each case by choosing the next women who match for age, parity, and gestational age but with spontaneous onset of labor. Inclusion criteria were as follows

1. Singleton pregnancy.
2. Cephalic presentation
3. PROM in whom spontaneous labor not started after 24 hours.
4. Mild preeclampsia/eclampsia
5 .Gestational diabetes mellitus
6. Gestational age >37 weeks.

Patients with previous uterine scar, IUFD, CPD, grand multipara, APH were excluded from the study. Labor induction was carried out according to the standard labor protocol of our hospital. Women received prostaglandins in the form of prostaglandin gel (PGE_2) to ripen the cervix every six hours for a maximum of two doses. The mean Bishop score at the time of instillation was less than four. Oxytocin was started after six hours of the last dose of PGE_2 gel. Failure of induction was considered when there was no onset of labor for 24 hours following the initiation of induction of labor. The fetal well-being was evaluated using electronic monitoring. Fetal heart rate was monitored intermittently every hour before the onset of labor and every half an hour during labor. A WHO modified partograph was used to monitor the progress of labour. On delivery, condition of the babies was assessed by measuring Apgar score at one minute and at five minutes. Perinatal morbidity was measured in terms of admissions to the neonatal Intensive care unit (NICU).

In the control group, patients with spontaneous onset of labour were involved. The mode of delivery, intrapartum and postpartum maternal and fetal complications were noted.

RESULTS

Mean age in Group A and Group B was 26.02 ± 3.81 years and 25.38 ± 4.65 years respectively. No statistical difference was observed (P = 0.2881) (Table 1). Whereas, the role of parity in two groups plays important roles i.e Women in spontaneous group have higher chances of spontaneous vaginal delivery than in induced labour group.

TABLE – 1 (DEMOGRAPHIC DATA)

AGE(in years)	Induced (n = 100)	Spontaneous (n = 100)
15-19	2	3
20-34	96	93
≥ 35	2	4
Marital Status		
Married	100	100
Unmarried	-	-
Parity		
Primi parity	73	51
2-3 deliveries	27	49

The rate of primary caesarean sections in control group was 56% in Group A whereas it was 21% in Group-B. 44% women in Group-A underwent spontaneous vaginal delivery as compared to 79% in Group-B. This difference was statistically significant (p value = 0.001) (Table 2). 12% women in Group-B suffered perinatal trauma as compared to 6% in Group A. The difference was statistically not significant (p = 0.1396) (Table3). There were 2 cases of hyper stimulation in induced labour group which is a known possible complication of induction of labour. Mean 1 minute Apgar score was 8.46± 0.66 in Group-A and 8.27± 0.85 in Group B. The mean 5 minute Apgar score was 8.49 ± 0.69 in group-A as compared to 8.33± 0.71 in Group-B. The difference was extremely statistically significant as P=0.0001 (Table 4). The mean

birth weight in induced group was 3.025±0.408 and 2.762 ±0.469 in spontaneous group. The difference was statistically significant (p value <0.0001). 15% of newborns in the spontaneous group were admitted to the neonatal intensive care unit (NICU) (Table 4). The mean duration of hospital stay in induced group was 4.71±2.58 and 2.57±2.53 in the spontaneous group (Table 3). The difference was statistically significant (p value=0.0001).

TABLE – 2 (MODE OF DELIVERY)

Mode of Delivery	Induced (n = 100)	Spontaneous (n = 100)	P value
Instrumental Delivery	10	18	0.0001
Caesarean Section	56	21	0.0001
Spontaneous delivery	34	61	0.0001

TABLE – 3 (COMPLICATIONS)

Complications	Induced (n = 100)	Spontaneous (n = 100)	P value
Perineal Lacerations			
Yes	6	12	0.1396
No	94	88	
Hysterectomy			
Yes	-	1	0.3185
No	-	-	
Post partum Stay			
< 7 days	42	74	0.0001
≥ 7 days	58	26	

TABLE – 4 (PERINATAL OUTCOME)

APGAR SCORE	Induced (n = 100)	Spontaneous (n = 100)	P value
< 7	8	15	0.001
≥ 7	92	85	0.0001
Birth Weight	6	12	
< 2500g	12	24	<0.0001
≥ 2500g	88	76	
Admission to Neonatal ICU	8	15	0.1585

DISCUSSION

Prostaglandins are given as cervical ripening agents to women for achieving a favorable cervical status. They can often initiate labor in some women eliminating the need for oxytocin. They are not generally used for induction in women with a favorable cervix because their action in favorable cervices is not well understood. Induction of labor is indicated when interrupting the pregnancy has some advantages for the mother or baby and is often carried out for postdated pregnancies where it has been shown to decrease perinatal mortality [2].When induction of labor is carried out after 37 weeks' gestation in the presence of medical indications such as gestational hypertension, it reduces the risk of adverse maternal outcomes [5]. There were no significant difference in the mean age, gestational age (in weeks), parity and birth weight in the present study. In our analysis, we found that induction of labor was associated with increased risk of caesarean delivery among both nulliparous and multiparous women. Several studies [6-8] have observed that induction of labor is associated with a significantly higher rate of caesarean section as compared to women who have spontaneous onset of labor. The statistics for England in 2011/2012 show an increased rate of emergency caesarean section for those women having an induction of labor compared with those women having a spontaneous labour [9]. Induction of labor should be offered to women with healthy pregnancy after 41 weeks. Risk of still birth increases from 2.1 per 10,000 ongoing pregnancies at 39 weeks to 10.8 per 10,000 ongoing pregnancies at 42 weeks of gestation [10]. A favorable pre induction Bishop Score of > 6 is predictive of a successful vaginal delivery. One should assess the cervix to determine the likelihood of success and to select the appropriate method of induction. Induction of women with an unfavorable cervix is associated with a higher failure rate in nulliparous patients and a higher Caesarean section rate in nulliparous and parous patients. In our study there was no statistical significance in the rates of postpartum hemorrhage and perineal lacerations between the two groups. Occurrence of perineal trauma was more in spontaneous labor group than in induced group. Our findings are in contrast to a study by Glaucia *et al* [11] published in WHO Bulletin 2011 there was a 1.24 relative rate (95% Confidence Interval) for perineal trauma in induced labor group than in spontaneous labor group. Gupta *et al* [12] in their study found that occurrence of perineal trauma was more in induced

than spontaneous labor group unlike our study. Neonatal outcome was better in induced group as compared to control group in the present study. The neonatal Apgar Scores at 1 and 5 minutes were better among babies delivered by induced labor compared to those in spontaneous labor. This shows statistical significant difference ($p<0.0005$). Our findings were similar to the findings of Orji *et al* [13] who found that mean APGAR score at 1 minute was 7.68 ± 2.5 in spontaneous group as compared to 8.72 ± 1.05 in induced group. The difference was statistically significant ($p = 0.001$). The mean 5 minute APGAR scores in his study was 8.93 ± 1.87 in control group and 9.45 ± 1.10 in induced group ($p = 0.008$). Glantz *et al*[14] studied neonatal outcomes in elective induction as compared to spontaneous labor groups in terms of 1 and 5 minute APGAR score and found no significant differences between the 2 groups. Gupta *et al* [12] also found that the mean 1 minute APGAR score and mean 5 minute APGAR scores were comparable in both the groups and the difference was statistically not significant. There was no difference in the odds of admissions to NICU between the groups receiving induction of labor or spontaneous onset of labor. [CI, 0.079 to 0.0479]; ***P*** = 0.1585) which was similar to many other studies [15]. It has been shown in some studies that elective induction of labor at term gestation can reduce perinatal mortality and the rate of caesarean section in developed countries without increasing the risk of operative delivery [16, 17]. There was a statistically significant difference in the postpartum hospital stay between the two groups ($p<0.001$). This is because of the fact that subjects in the induced group had higher rates of caesarean section that required a longer duration of hospital stay.

CONCLUSION

Induction of labor necessarily reduces some risks of an ongoing pregnancy such as preeclampsia, oligohydramnios, macrosomia or gestational diabetes mellitus. We can conclude from the present study that while induced labor may increase the chances of caesarean section, it does not adversely affect the neonatal outcome.

REFERENCES

1. Caughey AB, Sundaram V, Kaimal AJ, et al., (2009). Maternal and neonatal outcomes of elective induction of labor. Evid Rep Technol Assess. (176):1-257.
2. ACOG Committee on Practice Bulletins – Obstetrics (2009). ACOG Practice Bulletin No, 107, Induction of labor, Obstet Gynecol. 114; 386.
3. Bishop Eh (1964). Pelvic scoring for elective induction, Obstet Gynecol. 24:266.
4. Laughon SK, Zhang J, Troendle J, et al, (2011). Using a simplified Bishop score to predict vaginal delivery. Obstet Gynecol. 117; 805-11.
5. Koopmans CM, Bijlenga D, Groen H, Vijgen SM, Aarnoudse JG, and Bekedam DJ, et al,(2009). Induction of labour versus expectant monitoring for gestational hypertension or mild pre-eclampsia after 36 weeks' gestation, a multicentre, open-label randomised controlled trial. Lancet. 374:979-88.
6. Kiesewetter B, Lehner R (2012). Maternal outcome monitoring, induction of labor versus spontaneous onset of labor -a retrospective data analysis, Archives of Gynecology and Obstetrics. 286(1): 37 -41.
7. Grivell Rosalie M, Reilly AJ, Oakey H, Chan A, Dodd JM (2012). Maternal and neonatal outcomes following induction of labor, a cohort study. Acta Obstetriciaet Gynecologica Scandinavica. 91(2):198 -203.
8. Hoffman MK, Vahratian A, Sciscione AC, Troendle JF, Zhang J (2006). Comparison of progression between induced and non -induced women. Journal of Obstet Gynecol. 107(5):1029 -1034.
9. Knight H, Cromwell D, Meulen JVD, Gurol-Urganci I, Richmond D, Mahmood T, Templeton A, Dougall A, Johnson S (2013) Patterns of Maternity Care in English NHS Hospitals (2011/12). Royal College of Obstetricians and Gynaecologists. 27 Sussex Place, Regent's Park, London NW1 4RG.
10. Rosenstein MG, Cheng YW, Snowden JM, et al (2012). Risk of stillbirth and infant death stratified by gestational age. Obstet Gynecol. 120:76.
11. GláuciaVirgínia Guerra , José GuilhermeCecatti , João Paulo Souza , AníbalFaúndes , SirleiSianiMorais , Ahmet MetinGülmezoglu , Renato Passini , Mary Angela Parpinelli , Guillermo Carroli (2011). Elective induction versus spontaneous labour in Latin America. *Bulletin of the World Health Organization.* 89:657-665.
12. Gupta S, Shekhawat U, Mital P and Meena M (2014). To Study the Fetomaternal Outcome and Progress of Labour among Induced versus Spontaneous Labour in Nulliparous Women (Using Modified WHO Partograph) Sch J App Med Sci. 2(5A):1577-1580.
13. Orji EO, Olabode TO, (2008). Comparative study of labor progress and delivery outcome among induced versus spontaneous in nulliparous women using modified WHO partograph. NJOG. 3(1):24 -28.
14. Glantz JC, (2005). Elective induction v/s spontaneous labor association and outcome. J Reprod Med.50(4):235 -40.
15. Gelisen O, Caliskan E, Dilbaz S, Ozdas E, Dilbaz B, Ozdas E, (2005). Induction of labor with three different techniques at 41 weeks of gestation or spontaneous follow-up until 42 weeks in women with definitely unfavorable cervical scores. Eur J Obstet Gynecol Reprod Biol. 120:164-9.

16. Stock SJ, Ferguson E, Duffy A, et al, (2012). Outcomes of elective induction of labour compared with expectant management, population based study. BMJ.344:e2838.
17. Darney BG, Snowden JM, Cheng YW, et al (2013). Elective induction of labor at term compared with expectant management, maternal and neonatal outcomes. Obstet Gynecol. 122(4):761-9.