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Prospective study to assess the fetal and maternal outcome in cases of low risk primigravida in induced versus spontaneous onset of labour

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Abstract

Background: Childbirth is the period from the onset of regular uterine contraction until expulsion of placenta. The process by which this normally occurs is called labour. Induction of labour is the artificial initiation of uterine contraction prior to their spontaneous onset, leading to progressive dilatation and effacement of the cervix and delivery of the baby. Labour induction is indicated where the benefits to either the mother or the fetus outweighs the benefit of continuing pregnancy. The aim and objectives of the study was to study the progress of labour in nulliparous women who are having spontaneous labour and in those with induced labour in terms of augmentation of labour, mode of delivery, neonatal outcome and maternal complication.

Methods: Women recruited into the study in labour room of Cosmopolitan hospital. Case recruited when they came for elective induction and controls when they came in spontaneous labour after considering inclusion and exclusion criteria. The study included information after signature of a consent form from the women who came in the labour room for induction of labour during my study period (June 2013- December 2014). Low risk primigravida of age <35 years at 37 weeks to 42 weeks of gestation with elective labour inductions included. Mother and baby followed up after delivery in the wards or in NICU for outcome upto the time of discharge. We studied for the following maternal outcomes: method of induction, mode of delivery, duration and complications of stages of labour, postpartum hysterectomy; admission to the ICU; duration of postpartum stay in hospital; and maternal status at discharge. We assessed the following perinatal outcomes: at 5th minute Apgar score; birth weight; birth injuries; respiratory distress syndrome; admission to the NICU; number of days in NICU; neonatal deaths taking place in hospital within the first week of life; stillbirth or intrauterine death; neonatal jaundice and need for phototherapy.

Results: Mean duration of 1st stage in induced group was 15.33 hours (SD=7.41) and in spontaneous group was 10.73 hours (SD=3.79). Median time was 13 hour for induced group and 10 hour for spontaneous group. This difference was statistically significant (p <0.0001).Mean duration of 2nd stage in induced group was 1.53 hours (SD=0.94) and in spontaneous group was 1.22 hours (SD=0.51). Median time was 1.5 hours for induced group and 1 hour for spontaneous group. This difference was statistically significant (0.007). Mean duration of 3rd stage in induced group is 6.21 minutes (SD 5.147) and in spontaneous group is 5.38 minutes (SD 2.675). Median time was 5 minutes for induced group and spontaneous group. This difference was not statistically significant (p = 0.51). 14.8% of induced group had Protracted latent phase compared to 4.9% in spontaneous group. This difference was statistically significant (p=0.017). 9.9% of induced group had meconium stained liquor compared 9.9% of induced group had fetal distress compared 3.7% in spontaneous group. This difference was not statistically significant (p=0.076). 7.4% of induced group had fetal distress compared to 3.1% in spontaneous group. This difference was not statistically significant (P = 0.187). 4.9% of induced group had shoulder dystocia compared to 1.2% in spontaneous group. This difference was not statistically significant (0.097). 61.7% induced patients had normal delivery compared to 87% in spontaneous patients. This difference was statistically significant (p<0.0001). In induced group cesarean section is higher (33.3%) than in spontaneous group (11.1%). This difference was statistically significant (p<0.0001). In induced group ≤7 APGAR SCORE at 1 minute is higher (8.6%) than in spontaneous group (3.1%). This difference was not statistically significant (P = 0.116).

It was found that in induced group duration of 1st stage and 2nd stage is more than spontaneous group. Induction of labour had higher incidence of protracted latent phase and cesarean section which were statistically significant (<0.05).

Conclusions: Duration of 1st stage and 2nd stage of labour was significantly longer in induced group compared to spontaneous group. Protracted latent phase and Cesarean section were significantly higher in induced group compared to spontaneous group. Most common indication for cesarean section was protracted latent phase. Complications of 1st stage other than protracted latent phase, complications of 2nd stage and 3rd stage were higher in induced group than in spontaneous group but it was not statistically significant. Neonatal outcome like APGAR SCORE ≤7 at 5 minutes, RDS, Admission to NICU and neonatal jaundice were high in induced group but difference was not statistically significant

Keywords: Augmentation of labour, induced labour, neonatal outcome, partograph

Introduction

Induction of labour is carried out in over 20% of pregnancies in developed countries [1]. It is indicated when interrupting the pregnancy is thought to be advantageous for mother or baby and is often carried out for postdate pregnancies (>41 weeks gestation), where it has been shown to decrease perinatal mortality [2]. As perinatal mortality and fetal compromise increase progressively with gestation beyond 37 weeks [3].

induction of labour between 37and 41 weeks has the potential to improve neonatal outcomes. However, no trial or meta-analysis with adequate sample size has been done to examine the effect of induction of labour between 37 and 41 weeks gestation on perinatal mortality. Some studies have suggested that elective induction of labour (the induction of labour in the absence of medical indications) after 37 weeks gestation is associated with increased obstetric intervention, particularly caesarean delivery [4-7]. Conversely, when induction of labour is carried out after 37 weeks gestation in presence of medical indications such as gestational hypertension, it reduces the risk of adverse maternal outcomes [8].

Elective induction may in fact alter normal physiology when delivery begins and increase the rate of caesarean section, irrespective of parity, especially among women with an unfavourable cervix (e.g. women with the cervix in a posterior position, firm, poorly effaced and dilated, and with the fetus in a high station) [9]. A caesarean section is usually performed after elective induction with for the following indications: prolonged first stage of labour, fetal distress, failure to progress and intrapartum haemorrhage [7]. Some adverse maternal outcomes have been associated with elective induction of labour. These include an increase in instrumental vaginal deliveries; greater need for epidural analgesia; postpartum haemorrhage; increased need for blood transfusion; longer hospital stays and higher hospital costs [10]. With this in mind, the present prospective study was conducted to determine fetal and maternal outcome in cases of low risk primigravida in induced labour in comparison to spontaneous onset of labour in Cosmopolitan Hospital – Trivandrum, kerala-a tertiary center in south of India.

Materials and methods

A Prospective cohort study was conducted from june 2013 to dec 2014. Women recruited into the study in labour room of Cosmopolitan hospital. Case recruited when they came for elective induction and controls when they came in spontaneous labour after considering inclusion and exclusion criteria. The study included information after signature of a consent form from the women who came in the labour room for induction of labour during my study period (June 2013- December 2014). Low risk primigravida of age <35 years at 37 weeks to 42 weeks of gestation with elective labour inductions included. Mother and baby followed up after delivery in the wards or in NICU for outcome upto the time of discharge. We studied for the following maternal outcomes: method of induction, mode of delivery, duration and complications of stages of labour, postpartum hysterectomy; admission to the ICU; duration of postpartum stay in hospital; and maternal status at discharge. We assessed the following perinatal outcomes: at 5th minute Apgar score; birth weight; birth injuries; respiratory distress syndrome; admission to the NICU; number of days in NICU; neonatal deaths taking place in hospital within the first week of life; stillbirth or intrauterine death; neonatal jaundice and need for phototherapy.

Case: Women from gestational age 37 to 42 weeks primigravida low risk without any medical and surgical complication admitted to labour room for induction of labour

Control: Women from gestational age 37 to 42 weeks primigravida low risk without any medical and surgical complication admitted to labour room with labour pains on expectant management

Inclusion criteria

Primigravida of age <35 years at 37 weeks to 42 weeks gestation without any medical and surgical complications.

Exclusion criteria

Women who had recognised contraindication to induction of labour, including malpresentation, abdominal pregnancy, placenta praevia or previous scars on uterus
Women who undergone for infertility treatment.
Women aged >35 years.
Cases of multiple pregnancy.
Any cases referred intrapartum and postpartum.

Results

Mean duration of 1st stage in induced group was 15.33 hours (SD=7.41) and in spontaneous group was 10.73 hours (SD=3.79). Median time was 13 hour for induced group and 10 hour for spontaneous group. This difference was statistically significant (p <0.0001).Mean duration of 2nd stage in induced group was 1.53 hours (SD=0.94) and in spontaneous group was 1.22 hours (SD=0.51). Median time was 1.5 hours for induced group and 1 hour for spontaneous group. This difference was statistically significant (0.007). Mean duration of 3rd stage in induced group is 6.21 minutes (SD 5.147) and in spontaneous group is 5.38 minutes (SD 2.675). Median time was 5 minutes for induced group and spontaneous group. This difference was not statistically significant (p = 0.51). 14.8% of induced group had Protracted latent phase compared to 4.9% in spontaneous group. This difference was statistically significant (p=0.017). 9.9% of induced group had meconium stained liquor compared 9.9% of induced group had fetal distress compared 3.7% in spontaneous group. This difference was not statistically significant (p=0.076). 7.4% of induced group had fetal distress compared to 3.1% in spontaneous group. This difference was not statistically significant (P = 0.187). 4.9% of induced group had shoulder dystocia compared to 1.2% in spontaneous group. This difference was not statistically significant (0.097). 61.7% induced patients had normal delivery compared to 87% in spontaneous patients. This difference was statistically significant (p<0.0001). In induced group cesarean section is higher (33.3%) than in spontaneous group (11.1%). This difference was statistically significant (p<0.0001). In induced group ≤7 APGAR SCORE at 1 minute is higher (8.6%) than in spontaneous group (3.1%). This difference was not statistically significant (P = 0.116).

It was found that in induced group duration of 1st stage and 2nd stage is more than spontaneous group. Induction of labour had higher incidence of protracted latent phase and cesarean section which were statistically significant (<0.05).

Conclusions

Duration of 1st stage and 2nd stage of labour was significantly longer in induced group compared to spontaneous group. Protracted latent phase and Cesarean section were significantly higher in induced group compared to spontaneous group. Most common indication for cesarean section was protracted latent phase. Complications of 1st stage other than protracted latent phase, complications of 2nd stage and 3rd stage were higher in induced group than in spontaneous group but it was not statistically significant. Neonatal outcome like APGAR SCORE ≤7 at 5 minutes, RDS, Admission to NICU and neonatal jaundice were high in induced group but difference was not statistically significant.

Results

Mean age of induced group was 24.78 years (SD = 2.761) while that of the spontaneous group was 24.56 years (SD = 2.842). This difference was not statistically significant (p = 0.566).

Mean gestational age of induced group was 39.06 weeks (SD = 0.86) while that of the spontaneous group was 39.07 weeks (SD= 0.98).

Table 1: Bishop score (at the time of admission)

Bishop score	Induced		spontaneous		Total	
	N	%	N	%	N	%
1 (≤6)	71	87.6	109	67.3	180	74.1
2 (>6)	10	12.4	53	32.7	63	25.9
Grand Total	81(100%)		162(100%)		243	

χ^2= 10.631, df=1, P = 0.001, R.R.=1.30, C.I.=1.14-1.49

87.6% of induced group had unfavourable cervix (bishop score ≤6) at the time of admission compared to 67.3% in spontaneous group. This difference was statistically significant (P = 0.001).

Most of the patients were induced with PGE1 +Pitocin (48.1%) followed by PGE2+Pitocin (28.4%), pitocin alone (14.8%), PGE1 alone(4.9%) and PGE2 alone(3.7%) respectively.

Table 2: Duration of 1st stage

	1st stage duration (in hours)	
	induced	Spontaneous
N	81	162
Mean	15.33	10.73
Sd	7.41	3.79
Minimum	7	6
Maximum	39	26
Median time	13	10
I.Q.R.	5.5	4

Mann- Whitney U = 3200.50, P <0.0001

Mean duration of 1st stage in induced group was 15.33 hours (SD=7.41) and in spontaneous group was 10.73 hours (SD=3.79). Median time was 13 hour for induced group and 10 hour for spontaneous group. This difference was statistically significant (*p* <0.0001).

Table 3: Mean duration of 2nd stage

	2nd stage duration (in hours)	
	induced	Spontaneous
N	81	162
Mean	1.53	1.23
Sd	0.94	0.51
Minimum	0.5	1
Maximum	4	3
Median time	1.5	1
I.Q.R.	1	0.5

Mann-Whitney U = 5261.00, P = 0.007

Mean duration of 2nd stage in induced group was 1.53 hours (SD=0.94) and in spontaneous group was 1.22 hours (SD=0.51). Median time was 1.5 hours for induced group and 1 hour for spontaneous group. This difference was statistically significant (0.007).

Table 4: Mean duration of 3rd stage

	3rd stage duration (in minutes)	
	Induced	Spontaneous
N	81	162
Mean	6.21	5.38
Sd	5.147	2.675
Minimum	3	3
Maximum	25	25
Median time	5.00	5.00

Mann-Whitney U = 6295.500, p = 0.51

Mean duration of 3rd stage in induced group is 6.21 minutes (SD 5.147) and in spontaneous group is 5.38 minutes (SD 2.675). Median time was 5 minutes for induced group and spontaneous group. This difference was not statistically significant (p = 0.51).

Table 5: Protracted latent phase

Protracted latent phase	Induced		spontaneous		Total	
	N	%	N	%	N	%
Yes	12	14.8	8	4.9	20	8.2
No	69	85.2	154	95.1	223	91.8
Grand Total	81(100%)		162(100%)		243	

χ^2=5.728, df=1, p=0.017, RR=3, CI=1.28-7.05

14.8% of induced group had Protracted latent phase compared to 4.9% in spontaneous group. This difference was statistically significant (p=0.017).

9.9% of induced group had meconium stained liquor compared to 3.7% in spontaneous group. This difference was not statistically significant (0.076). 9.9% of induced group had fetal distress compared 3.7% in spontaneous group. This difference was not statistically significant (p=0.076). 1.2% of induced group had abruption compared to absent in spontaneous group. This difference was not statistically significant (p=0.33).

Table 6: Normal delivery

Normal delivery	Induced		Spontaneous		Total	
	N	%	N	%	N	%
Yes	50	61.7	141	87	191	78.6
No	31	38.3	21	13	52	21.4
Grand Total	81(100%)		162(100%)		243	

χ^2==19.09, df=1, P <0.0001, RR=2.95, CI=1.82- 4.80

61.7% induced patients had normal delivery compared to 87% in spontaneous patients. This difference was statistically significant (p<0.0001).

Table 7: Cesarean section

Cesarean section	Induced		Spontaneous		Total	
	N	%	N	%	N	%
Yes	27	33.3	18	11.1	45	18.5
No	54	66.7	144	88.9	198	81.5
Grand Total	81(100%)		162(100%)		243	

χ^2=16.231, DF=1, P = <0.0001, RR=3, CI=1.76-5.11

In induced group cesarean section is higher (33.3%) than in spontaneous group (11.1%). This difference was statistically significant (p<0.0001). Most common indication for LSCS in 1st stage of labour was protracted latent phase (33.3%) followed by meconium stained liquor (25.9%), fetal distress (25.9%), abruption (3.7%) and cord prolapse (3.7%) respectively and in 2nd stage indication was fetal distress (18.5%).

In induced group Assisted vaginal delivery is higher (4.9%) than in spontaneous group (1.9%). This difference was not statistically significant (p=0.226). 7.4% of induced group had perineal tear compared to 2.5% in spontaneous group. This difference was not statistically significant (p=0.088).

4.9% of induced group had traumatic PPH compared to 1.2% in spontaneous group. This difference is not statistically significant (p = 0.097). 6.2% of induced group had atonic PPH compared to 1.9% in spontaneous group. This difference was not statistically significant (p=0.121).

1.2% of induced group had retained placenta compared to absent in spontaneous group. This difference was not statistically significant (p=0.33). 1.2% of induced group had manual removal

of placenta compared to absent in spontaneous group. This difference was not statistically significant (p=0.33). In induced group mean postpartum stay was 4.12 days (SD=4.12) while that of spontaneous group was 3.33(SD=0.86).

The highest percentage of babies were in the weight category group of 2500 to 3499 gram categories in both spontaneous and induced group followed by ≥3500 gram and <2500 gram respectively. This difference was not statistically significant (P=0.64).

In induced group ≤7 APGAR SCORE at 1 minute is higher (8.6%) than in spontaneous group (3.1%). This difference was not statistically significant (P = 0.116). In induced group ≤7 APGAR SCORE at 5 minute is higher (7.4%) than in spontaneous group (3.1%). This difference was not statistically significant (p=0.187).

In induced group need for resuscitation is higher (4.9%) than in spontaneous group (0.6%). This difference was not statistically significant (P = 0.097).In induced group RDS is higher (7.4%) than in spontaneous group (3.1%). This difference was not statistically significant (P = 0.187).In induced group neonatal jaundice is higher (7.4%) than in spontaneous group (3.1%). This difference was not statistically significant (P = 0.187). In induced group need for phototherapy is higher (6.2%) than in spontaneous group (1.9%). This difference was not statistically significant (P = 0.121). In induced group admission to NICU is higher (6.2%) than in spontaneous group (1.2%). This difference was not statistically significant (P = 0.121). The mean number of days in NICU for induced group was 2.6 days (SD=0.894) while that for spontaneous group was 2.5 days (SD=0.707).

Discussion

Osmundson S *et al*, conducted a retrospective cohort study in 2006 and 2008 of 102 nulliparous electively induced were compared with 102 nulliparous women who were expectantly managed at 39-41 weeks of gestation. Women who underwent an elective induction of labor did have longer duration of labor (median 16.5 compared with 12.7 hours, P<.001) [11]. One another retrospective cohort study conducted by Harper LM *et al*, of all consecutive women admitted for labor at 37 weeks or more of gestation from 2004-2008 who reached the second stage of labor. women who were induced had a significantly longer total time in labor than women who labored spontaneously (median [95 percentile] in hours for nulliparous women): 5.5 [16.8] induced compared with 3.8 [11.8] spontaneous [12]. Similarly, in our study median time of 1st stage and 2nd stage in induced group was longer compared to spontaneous group (for 1st stage 13 hours vs 10 hours and for 2nd stage 1.5 hours vs 1 hour). This difference was statistically significant (p <0.05).

Harper LM *et al*, conducted a retrospective cohort study of all consecutive women admitted for labor at 37 weeks or more of gestation from 2004-2008 who reached the second stage of labor. Of 5,388 women in the cohort, 2,021 spontaneously labored, 1,720 were augmented, and 1,647 were induced. The time to progress 1 cm dilation in latent labor (less than 6 cm) was significantly longer in women who were induced compared with women who experienced spontaneous labor [12]. Similarly, in our study 14.8% of induced group had Protracted latent phase compared to 4.9% in spontaneous group. Induced group had 3 times higher risk (RR=3.00 [C.I.=1.28-7.05]) of protracted latent phase than spontaneous group. This difference was statistically significant (p=0.017). Protracted latent phase was most common indication for cesarean section.

Glantz JC compared spontaneously laboring women (n = 10,608) with women who underwent induced labor for no apparent medical/obstetric reason (n = 1,241). Odds ratios for diagnoses of nonreassuring fetal heart rate patterns were independently increased following elective induction [7]. Similarly in our study 9.9% of induced group had fetal distress in 1st stage compared 3.7% in spontaneous group. Induced group had higher risk of fetal distress in 1st stage than spontaneous group (RR= 2.67 [C.I.=0.96-7.43]) but in our study this difference was not statistically significant (0.076). Higher fetal distress may be associated with protracted latent phase and longer duration of labour.

Osmundson S *et al*, conducted a retrospective cohort study in 2006 and 2008 of 102 nulliparous electively induced were compared with 102 nulliparous women who were expectantly managed at 39-41 weeks of gestation more frequent occurrence of meconium in the expectantly managed group (36.3% compared with 7.0%, P<.001) [11]. In our study 9.9% of induced group had meconium stained liquor compared to 3.7% in spontaneous group. Induced group had higher risk of meconium stained liquor than spontaneous group (RR= 2.67 [C.I.=0.96-7.43]). This difference was not statistically significant (0.076). Higher Meconium stained liquor may be associated with longer duration of labour.

Glantz JC compared spontaneously laboring women (n = 10,608) with women who underwent induced labor for no apparent medical/obstetric reason (n = 1,241). Placental abruption was not associated with elective induction [7]. Similarly, in our study 1.2% of induced group had abruption compared to absent in spontaneous group. This difference was not statistically significant (p = 0.33).

Darney BG *et al*, conducted a retrospective cohort study in 2006 to compare elective induction of labor at term with expectant management. Elective induction was not associated with increased odds of shoulder dystocia at any term gestational age [13]. Similarly, in our study 4.9% of induced group had shoulder dystocia compared to 1.2% in spontaneous group (RR = 4.00 [C.I.=0.75-21.38]. This difference was not statistically significant (p = 0.097). Higher shoulder dystocia may be related to higher birth weight in induced group compared to spontaneous group.

A retrospective cohort study conducted by Darney BG *et al*, in 2006 conducted to compare elective induction of labor at term with expectant management. Elective induction was not associated with increased odds of severe lacerations at any term gestational age [13]. Similarly, in our study 7.4% of induced group had perineal tear compared to 2.5% in spontaneous group. This difference was not statistically significant (p=0.088) (RR = 3.00 [0.87-10.33]. Higher perineal tear could be explained by higher assisted vaginal delivery in induced group in comparison to spontaneous group.

A retrospective cohort study conducted by Osmundson S *et al*, have concluded that there were no significant differences in postpartum hemorrhage [23]. In our study 4.9% of induced group had traumatic PPH compared to 1.2% in spontaneous group. This difference was not statistically significant (p = 1.884). Higher PPH could be explained by higher assisted vaginal delivery and higher perineal tear in induced group in comparison to spontaneous group.

Based on literature [14, 15] more women had spontaneous vaginal delivery among those in spontaneous labour compared to who had induced labour. Ernest O Orji *et al* conducted a prospective study in Nepal in 2008 of 136 women that had an induction to 136 women those that presented in spontaneous labor. More women had spontaneous vaginal delivery among those in spontaneous labour (72.1% versus 64.7%) P=0.0001 [15]. In our

study in spontaneous group normal delivery was higher 87% than in induced group 61.7%. This difference was statistically significant (p<0.0001).

Based on literature [14, 15] nulliparas undergoing induction had an increased cesarean rate in comparison to spontaneous labour (8.7% to 43.1% versus 5.0% to 34.3%). In contrast to our study in literature [13] nulliparous undergoing induction had an decreased cesarean rate (16%) in comparison to spontaneous group. In our study induced group had cesarean section higher (33.3%) than in spontaneous group (11.1%). This difference was statistically significant (p<0.0001). In our study most common indication for LSCS in 1st stage of was protracted latent phase (33.3%) followed by meconium stained liquor (25.9%), fetal distress (25.9%), abruption (3.7%) and cord prolapse (3.7%) respectively and in 2nd stage indication was fetal distress (18.5%).

Vrouenraets FP *et al*, conducted a prospective cohort study was performed in 1,389 nulliparous women at term with vertex singleton gestations. A Bishop score of 5 or less was a predominant risk factor for a cesarean delivery (adjusted OR 2.32; 95% CI 1.66-3.25) [14]. In our study 87.6% of induced group had unfavourable cervix (bishop score ≤6) at the time of admission compared to 67.3% in spontaneous group and induced group had cesarean section higher (33.3%) than in spontaneous group (11.1%).This difference was statistically significant (P = 0.001). Bishop score of 6 or less was predominant risk factor for cesarean delivery.

A retrospective cohort study conducted by Osmundson S *et al*, have concluded that there were no significant differences in operative vaginal delivery [11]. In this study higher rate of assisted vaginal delivery may be because rate of cesarean delivery was comparatively low in both groups (9.9% vs 6.5%). In our study in induced group Assisted vaginal delivery is higher (4.9%) than in spontaneous group (1.9%). This difference was not statistically significant (p=0.342). Lower rate of assisted vaginal delivery may be because rate of cesarean section was comparatively high in both groups (33.3% vs 11.1%).

A retrospective cohort study conducted by Osmundson S *et al*, have concluded that there were no significant differences in Apgar score less than 7 at 5 minutes [11]. Similarly, in our study in induced group ≤7 APGAR SCORE at 5 minute was higher (7.4%) than in spontaneous group (3.1%). This difference was not statistically significant (P = 0.187).

Glantz JC compared spontaneously laboring women (n = 10,608) with women who underwent electively induced labor (n = 1,241). RDS was not associated with elective induction [7]. Similarly**,** in our study in induced group RDS is higher 7.4% than in spontaneous group 3.1%. This difference was not statistically significant (P = 0.187) (RR = 2.40 [C.I. = 0.76-7.63]). Higher RDS may be because of higher meconium stained liquor in induced group than in spontaneous group.

Retrospective cohort study conducted by Osmundson S *et al*, have concluded that there were no significant differences in neonatal intensive care unit admission [11]. In our study in induced group admission to NICU was higher (6.2%) than in spontaneous group (1.2%). This difference was not statistically significant (P = 0.121) (RR = 3.33 [C.I. = 0.82 -13.60]). This difference in NICU admission may be because of higher respitory distress syndrome in induced group.

Darney BG *et al*, conducted a retrospective cohort study in 2006 to compare elective induction of labor at term with expectant management. Elective induction was associated with increased odds of hyperbilirubinemia at 37 and 38 weeks of gestation[13]. Similarly, in our study in induced group neonatal jaundice is higher 7.4% than in spontaneous group 3.1%. This difference was not statistically significant (P = 0.187) (RR = 2.40 [C.I. = 0.76-7.63]). In our study no any baby had birth injury and Stillbirth or intrauterine death in both groups.

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