Original Research Article

A Hospital Based Comparative Study of Labour Progress and Delivery Outcome Among Spontaneous Induced Patients

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Received: 21-09-2021 / Revised: 08-12-2021 / Accepted: 26-12-2021

Abstract

Background: Indications for induction of labour have essentially not changed. When concern for the wellbeing of the mother arises, primary indications for induction include active medical disorders, being well beyond the due date and prolonged ruptured membranes. Indication is also justified when the fetus is at risk. The aim of this study to compare the progress of labour and its outcome among spontaneous and induced labour. **Materials & Methods:** A prospective study done on 100 pregnant women were selected from outpatient department at district hospital Dholpur, Rajasthan, India during one year period. Study group consisted of two groups. These groups constituted of pregnant women at term admitted to District Hospitals in spontaneous labour and pregnant women admitted for induction of labour for either medical or obstetric reasons. Detailed antenatal history followed by basic pelvic assessment is done and reactive FHR pattern is assessed. Progress of labour is monitored with modified WHO partograph. They were monitored with maternal pulse, blood pressure, foetal heart rate (FHR), uterine contractions, scar tenderness, colour of the liquor for early detection of impending uterine scar rupture and foetal distress. **Results:** The result states that there is no significant (P>0.05) different in age group between spontaneous labour patients and induced patients. The gestational age at which patients were induced (39.012±1.12 wks) were higher than patients with spontaneous labour (38.572±0.92 wks) however the difference was very low and is statistically not significant. Percentage of caesarean delivery among induced women is 24% and in spontaneous labour is 2%. Only one patient comes under caesarean section due to fetal distress in spontaneous group and 12 patients comes under caesarean section due to fetal abnormality in induced groups. **Conclusion:** We conclude that spontaneous pregnancies cost effective compared to induced pregnancies.

Keywords: WHO Partograph, Primigravida, Multigravida, Induction, Spontaneous, Caesarean Section

Introduction

Labour induction is the initiation of uterine contractions prior to their spontaneous onset, leading to cervical dilation and effacement and delivery of the baby[1]. The term generally refers to the third trimester and to last 4 weeks of the second trimester, when fetal survival is the anticipated outcome.

Induction of labour is one of the most common procedures during pregnancy. Data from the National Centre for Health Statistics for the last decade indicate that the rate of labour induction has increased gradually from 9% to 20%. This increase has been noted both at community Hospitals and at the university tertiary care hospitals. Explanations for this jump in the induction rate are complex and multifactorial. Better planning of birth by the physician, patient and her family is the most common reason. Other reasons include the availability of Food and Drug Administration (FDA) approved cervical ripeners, more released attitudes towards marginal or elective inductions and litigious constraints[2].

Increase in Caesarean delivery rates associated with induction can be due to the uterus being poorly prepared for labour and the physician's preferences regarding the duration of attempt at induction, especially in circumstances of the unripe cervix. The American College of Obstetricians and Gynaecologists practice bulletin "Induction of Labour" states, "Generally induction of labour has merit as a therapeutic option when the benefits of expeditious delivery outweigh the risks of continuing pregnancy. The benefit of labour induction must be weighed against the potential maternal or fetal risks associated with the procedure[3].

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As the induction have both advantages and disadvantages there is a need to study the progress of labour, maternal and fetal outcomes of both spontaneous and induction labour and to compare them. The aim of this study to compare the progress of labour and its outcome among spontaneous and induced labour.

Materials & methods

A prospective study done on 100 pregnant women were selected from outpatient department at district hospital Dholpur, Rajasthan, India during one year period. Study group consisted of two groups. These groups constituted of pregnant women at term admitted to District Hospitals in spontaneous labour and pregnant women admitted for induction of labour for either medical or obstetric reasons.

Inclusion Criteria

- Singleton Pregnancy
- Vertex Presentation
- Completed 37 weeks
- Spontaneous true labor pain
- Need for induction of labor
- Reactive fetal heart rate pattern

Exclusion Criteria

- Multiple gestation
- Medical Complications of pregnancy where delivery is urgent
- Previous LSCS
- Abnormal placenta and breech and other abnormal presentation

Method

Basic assessment for risk factors is done in antenatal patients with spontaneous onset of labour and if the patient comes under uncomplicated term gestation she is included in the study. Women

were included in the study group if their gestational age was atleast 37 weeks at admission to labour, carried a singleton pregnancy in vertex presentation and had an reactive fetal heart rate pattern.
Detailed antenatal history followed by basic pelvic assessment is done and reactive FHR pattern is assessed. Progress of labour is monitored with modified WHO partograph. The need for further acceleration of labour is decided based on the partograph.

Spontaneous Labour
Labour that begins naturally or spontaneously is when contraction start on their own. During spontaneous labour, the contractions grow and intensify at their own phase. The question of how labour starts is still not completely answered.

Induction of Labour
Induction of labour means initiation of uterine contractions (after fetal viability) for the purpose of vaginal delivery.

Augmentation of Labour
Augmentation is the process of stimulation of uterine contraction that are already present but found to be inadequate.
Once patient come with spontaneous labour initial PV is done and Bishop Score is assessed. After an enema, patient is allowed to progress on her own. Next PV is repeated after 4 hours or when there is draining. Once the patient enters into active phase labour is monitored with partograph. If a repeat PV examination finding crosses the alert line, labour is augmented with syntocinon.
Once the patient enters into active labour, active management of labour is done.
In the control group following a basic pelvic assessment (to rule out cephalopelvic disproportion), non-stress test is done, and bishop score is assessed. If the score is less than 4 PGE2 gel is applied intracervically. The patient is reassessed after spontaneous onset of labour or draining PV or after 6 hours – whichever is earliest.
The method of further induction is decided and implemented according to bishop score. If Bishop Score is unfavourable, then another dose of gel was used. Maximum 3 doses of gel were used at 6 hours interval. Still if score was unfavourable then misoprostol tablets 25 µg was kept to maximum of 3 doses 4 hours apart.
A post induction Bishop Score of 6 is favourable. Labour was accelerated with oxytocin and artificial rupture of membranes according to per vaginal functions. In the interval period fetal heart rate monitoring is done to assess the fetal wellbeing. The data was collected on the predesigned performa. They were monitored with maternal pulse, blood pressure, foetal heart rate (FHR), uterine contractions, scar tenderness, colour of the liquor for early detection of impending uterine scar rupture and foetal distress.

Statistical Analysis
The statistical package which is used for doing analysis is SPSS 16.0 version (statistical package for social sciences). The tools which are used for analysing raw data or ANOVA (analysis of variance) and cross tabulation.

Results
The result states that there is no significant (P>0.05) different in age group between spontaneous labour patients and induced patients. The gestational age at which patients were induced (39.012±1.12 wks) were higher than patients with spontaneous labour (38.572±0.92 wks) however the difference was very low and is statistically not significant.
Percentage of caesarean delivery among induced women is 24% and in spontaneous labour is 2%.It is well evident that women in spontaneous labour had higher chance of normal vaginal delivery than women in induced group. In patients with spontaneous labour the duration of active phase is shorter when compared to induced labour (table 1).

Table 1: Characteristics of studied population

Variables	Spontaneous labour (N=50)	Induction labour (N=50)	P-value
Age (yrs)	25.23±3.84	24.77±3.83	>0.05
Gestational age (wks)	38.572±0.92	39.012±1.12	>0.05
Duration of active phase (hour)	2.43±1.32	3.67±2.68	<0.001*
Parity			
Primigravida	33 66%)	37 (74%)	>0.05
Multigravida	17 (34%)	13 (26%)	
Mode of delivery			
Emergency LSCS	1 (2%)	12 (24%)	>0.05
NVD	46 (92%)	31 (62%)	
Vaccum delivery	3 (6%)	7 (14%)	

The Apgar scores of the babies at 1 minute in the spontaneous group was found to be similar to that of induced group (Apgar>8 in spontaneous – 94% in induced – 92%). At 5 minutes in the spontaneous group was found to be better than the induced group (Apgar>8 in spontaneous – 98% in induced – 96%) (table 2).

Table 2: APGAR score at 1 min. & 5 min. in between groups

APGAR score		Spontaneous labour (N=50)	Induction labour (N=50)	P-value
At 1 min.	**>8**	47 (94%)	46 (92%)	>0.05
	<8	3 (6%)	4 (8%)	
At 5 min.	**>8**	49 (98%)	48 (96%)	>0.05
	<8	1 (2%)	2 (4%)	

Only one patient comes under caesarean section due to fetal distress in spontaneous group and 12 patients comes under caesarean section due to fetal abnormality in induced groups (table 3).

Table 3: Indication for Caesarean delivery

Variables	Spontaneous labour (N=1)	Induction labour (N=12)
Failed induction	-	5
Fetal distress	1	2
Meconium-stained liquor	-	3
Prolonged PROM	-	1
Deep transverse arrest	-	1

Discussion

Labour is induced when delivery of the pregnancy will be of benefit to the health of the fetus or mother or both. Induction of labour excludes those situations where it is considered more expedient to maternal and or fetal safety and wellbeing to deliver the pregnancy by caesarean section. The induction is justified when the benefits to either mother or fetus outweigh those of continuing the pregnancy.

The mean maternal age was 25.23 yrs in spontaneous group and 24.77 yrs in induced group. This corresponds favourably to studies conducted by Ojaswini Patel et al[4] found that there was no difference in mean age, gestational age at delivery, height, weight and pre-induction Bishop's score in studies and control group.

The gestational age at which patients were induced were higher than patients with spontaneous labour however the difference was very low and is statistically not significant. On an average most of the women entered into spontaneous labour at and around 38weeks. This is consistent with study by Robert L Goldenberg which shows black, Asian women delivery at 39 compared with American44. Considering parity with mode of onset of labour there was significantly higher parity in spontaneous labour groups. These results are in comparison to the study by Heffner et al. The maternal characteristics differed significantly among the groups with respect to the presence of antenatal complications like PIH, diabetes, GDM, PROM, postdatism, BOH etc. They were present in a significantly higher percentage in induced group.

It is well evident that women in spontaneous labour had higher chance of full term normal vaginal delivery than women in induced group. Our finding of modest increase in caesarean delivery among women with induced labour. Our finding was consistent with the study done by like Barbara et al (2012)[5] who observed that women who had induction between 38-42 weeks had a significantly higher rate of caesarean section (15.20% v/s 8.60%) than spontaneous labour group. Grivell et al.[6] also reached to a similar conclusion stating that induction of labour was associated with a 67% increased relative risk for caesarean section compared with spontaneous labour. Hoffman et al.[7] also stated that caesarean section rate was elevated in induction group (3.92% v/s 2.30%, $P < 0.05$) but reported a lower rate of cesarean section in both groups.

The mean duration of active phase in induced labour and spontaneous labour was comparable and statistically not significant (2.43 ± 1.32 v/s 3.67 ± 2.68 hrs). Our finding was in contrast to the finding observed by Hoffman et al.[7] who concluded that women who experienced elective induction of labour had a shorter active phase of labour than did those admitted in spontaneous labour (99 min in induced labour versus 161 min in spontaneous labour, $p < 0.001$) but in consistent with the study done by Harper et al.[8] who concluded that the median time to progress 1 cm dilatation in active labour was similar in spontaneous and induced labour.

All the babies were live born and there were no neonatal deaths. The mean birth weight of the babies in spontaneous group and that in groups induced were not statistically significant. The Apgar scores of the babies at 5 minutes in the spontaneous group was found to be better than the induced group (Apgar<8 in spontaneous – 2% in induced -4%).

Mean 1 minute APGAR score and mean 5-minute APGAR score were comparable in both the groups and the difference was statistically not significant. Glantz JC et al.[9] studied neonatal outcomes in elective induction v/s spontaneous labour groups in terms of 1 and 5 minute APGAR score<7, Neonatal ICU admissions and found no significant differences between the 2 groups. Orji et al.[10] studied 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 score in his study was 8.93±1.87 in Group-A and 9.45±1.10 in induced group ($p = 0.008$).

Conclusion

We conclude that spontaneous pregnancies cost effective compared to induced pregnancies. The induction of labour when compared with spontaneous labour at term, does not affect the maternal or neonatal outcome in carefully selected patient population.

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Conflict of Interest: Nil Source of support: Nil