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Original Research Article

A comparative study of labour progress and delivery outcome among spontaneous induced patients

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ABSTRACT

Background: Induction of labour is one of the most common procedures during pregnancy. Indications for induction of labour have essentially not changed. The benefit of labour induction must be weighed against the potential maternal or fetal risks associated with the procedure. Objectives were to compare the duration and progress of labour in spontaneous and induced labour, to compare the maternal outcome and fetal outcome, to compare the mode of delivery in spontaneous and induced labour, and to compare the need for oxytocin augmentation.

Methods: It was a prospective study conducted in the department of obstetrics and gynaecology, MIMS hospital, Vizianagaram from Jan 2021 to June 2022. Study population consisted of two groups.

Results: A total of 300 patients were taken into study. Among them 150 patients were those who went into spontaneous progression and the other 150 included patients who were induced. Women in spontaneous labour had higher chance of full term normal vaginal delivery than women in induced group. Various factors like maternal age, gestational age, parity, were compared between both these groups using a proforma. In our study we found that patient gets into spontaneous labour on an average around 38 weeks.

Conclusions: Latent phase and active phase of labour are prolonged in induced patients when compared to that of spontaneous labour. There was an increase in caesarean section rate from 1.3% in induced patients to 23.3% in spontaneous labour patients. Apgar scores of the babies at 5 minutes in the spontaneous group were found to be better than the induced group.

Keywords: Fetal outcome, Induced labour, Maternal outcome, Spontaneous labour

INTRODUCTION

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. Explanation for this rise 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 relaxed attitudes towards marginal or elective inductions and litigious constraints.¹

Indications for induction of labour have essentially not changed. When concern for the wellbeing of the mother arises, primary indications for induction include medical disorders, being well beyond the due date and prolonged ruptured membranes. Indication is also justified when the fetus is at risk.

Another general concept is the recognition that induction is associated with increased complications as compared

with spontaneous labour. Complications include an increase of chorioamnionitis and increased cesarean delivery.

Increase in cesarean 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.

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.

METHODS

It was a prospective study conducted in the department of obstetrics and gynaecology, in our hospital from January 2021 to June 20

Study population

Study population consisted of two groups.

A total of 300 patients were included in the study out of which 150 patients had spontaneous onset of labour and 150 patients in induced labour.

It was a comparative study involving women with spontaneous labour and those induced with PGE 2 gel or PGE 1 after obtaining informed consent.

Basic assessment for risk factors was done in antenatal women with spontaneous onset of labour and if women come under uncomplicated term gestation she was included in the study.

This study excluded women in pre-term labour and other obstetric and medical complications requiring emergency delivery.

Progress of labour was monitored by modified WHO partograph and further acceleration of labour was based on the partograph.

Inclusion criteria

Patients with singleton pregnancy, vertex presentation, completed 37 weeks, spontaneous true labour pain, need for induction of labour, reactive fetal heart rate pattern were included in the study.

Exclusion criteria

Patients with multiple gestation, breech and other abnormal presentation, antepartum haemorrhage, preterm labour, previous LSCS, severe oligohydramnios.

Statistical analysis

Statistical analysis was done by mean, median and standard deviation.

RESULTS

Woman in spontaneous labour had higher chances of normal vaginal delivery when compared to induced labour group.

Table 1: Distribution of labour according to mode of onset.

| | Frequency | Percent |
|---------------------------|-----------|---------|
| Spontaneous labour | 150 | 50.0 |
| Induction labour | 150 | 50.0 |
| Total | 300 | 100.0 |

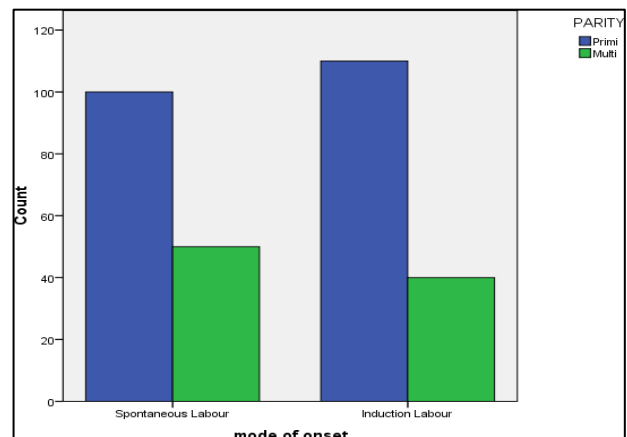


Figure 1: Mode of onset.

Table 2: Age distribution of women.

| Mode of onset | Parity | Mean | N |
|---------------------------|--------|-------|-----|
| Spontaneous labour | Primi | 24.42 | 100 |
| | Multi | 25.50 | 50 |
| | Total | 24.78 | 150 |
| Induction labour | Primi | 24.50 | 110 |
| | Multi | 24.08 | 40 |
| | Total | 24.39 | 150 |
| Total | Primi | 24.46 | 210 |
| | Multi | 24.87 | 90 |
| | Total | 24.58 | 300 |

Women in induced labour require higher oxytocin augmentation than women in spontaneous labour (Figure 3).

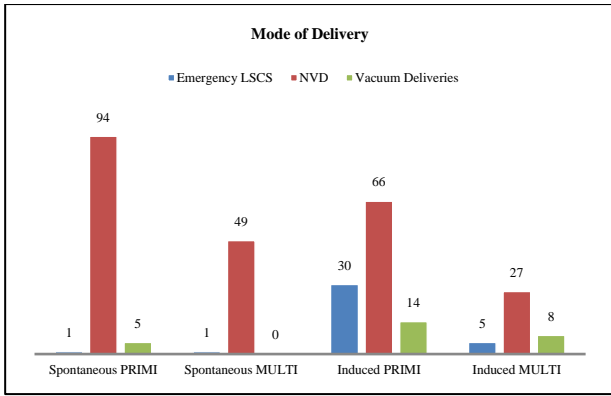


Figure 2: Mode of delivery.

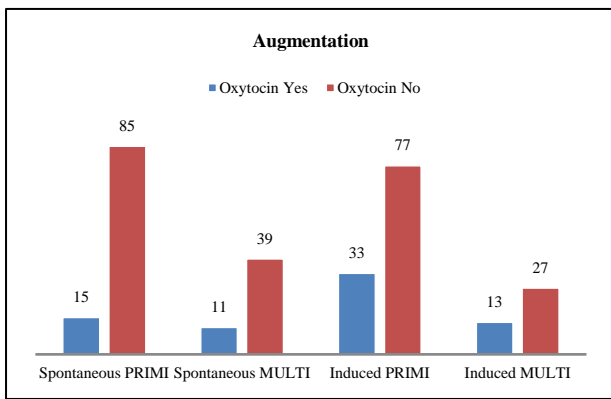


Figure 3: Augmentation with oxytocin.

Table 3: Duration of latent phase.

| Mode of onset | Parity | Mean duration | No. of cases |
|--------------------|--------|---------------|--------------|
| Spontaneous labour | Primi | 5.1 hours | 100 |
| | Multi | 4.4 hours | 50 |
| Induced labour | Primi | 11.7 hours | 110 |
| | Multi | 10 hours | 40 |

The mean duration of latent phase of labour was 11.2 hours in induced group which was more when compared to 4.8 hours in spontaneous group.

Table 4: Active phase of spontaneous and induced labour.

| Mode of onset | Parity | Mean duration | No. of cases |
|--------------------|--------|---------------|--------------|
| Spontaneous labour | Primi | 2.4 hours | 66 |
| | Multi | 2.4 hours | 29 |
| Induced labour | Primi | 3.4 hours | 73 |
| | Multi | 4.1 hours | 31 |

In patients with spontaneous labour the mean duration of active phase is 2.4 hours which was shorter when compared to 3.6 hours in induced labour group.

Table 5: Indications for caesarean delivery.

| INDICATIONS | Spontaneous N (%) | Induced N (%) |
|-------------------------|-------------------|---------------|
| Failed induction | - | 15 (10) |
| Fetal distress | 2 (1.3) | 7 (4.6) |
| Meconium-stained liquor | - | 8 (5.3) |
| Prolonged PROM | - | 2 (1.3) |
| Deep transverse arrest | - | 2 (1.3) |

Percentage of caesarean delivery among induced women was 23.3%.

Percentage of caesarean delivery among women in spontaneous labour was 1.3%.

Table 6: Maternal complications occurring during labour.

Maternal complications were more in induced labour group when compared to spontaneous labour group.

APGAR score at 5 minutes value >8 in babies of spontaneous group was found to be better than that in induced group.

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. A general concept is the recognition that the induction is associated with increased complications as compared to spontaneous labour. This concept is the basis for the need for our study. Our study comprises of women who were relatively low risk.

This was a prospective study involving 300 patients. 150 women who went in for spontaneous labour and 150 women induced with prostaglandin E2 gel.

The patient characteristics like maternal age, gestational age, parity, mode of delivery, the need for oxytocin augmentation, the duration of first stage of labour and perinatal outcome was statistically analysed.

Patient's characteristics like maternal age and gestational age was statistically analysed though difference in maternal age in both groups significant statistically, the difference in age of patient by few months is not likely to affect the obstetric outcome.

The mean maternal age was 24.7 in spontaneous group and 24.3 in induced group. This corresponds favourably to studies conducted by Johnson et al.²

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 38 weeks.

This was consistent with study by Goldenberg which shows black, Asian women delivery at 39 weeks compared with American women.³ 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.⁴ 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 was well evident that women in spontaneous labour had higher chance of full term normal vaginal delivery than women in induced group. Spontaneous labour- 98.7% normal delivery and 1.3% caesarean delivery. Induced labour- 76.7% normal delivery and 23.3% caesarean delivery.

Our finding of modest increase in caesarean delivery among women with induced labour is concurrent with the results of Heffner et al.⁴ He did observe that the caesarean delivery rate was 24.7% in induced nullipara's and 13.7% in spontaneous labour group.

Among multipara's the caesarean rate was 4.5% in induced woman compared to 2.4% in spontaneous labour group. Failed induction being common indication for caesarean delivery in induced patients.

Whereas foetal distress in spontaneous labour group. This goes to say that induction does not contribute significantly to fetal distress. This is in similar to the study by Johnson et al where failure to progress was the most common indication followed by fetal distress.²

The mean duration of latent phase of labour is more in induced group (11.2 hours) and the mean duration of latent phase of labour 4.8 hours in spontaneous group with the significant p value of less than 0.01.

This is inconsistent to the findings of James et al who reported that the duration of first stage of labour was shorter in induction group than in the spontaneous group i.e. 6 hours versus 7.2 hours (p.005).⁵

In patients with spontaneous labour the duration of active phase was shorter when compared to induced labour. The mean difference in multi among induced patients was

higher in 3 cm dilatation when compared to spontaneous group that is because of two patients who had abnormally prolonged labour one who went in for emergency LSCS because of deep transverse arrest and other vacuum due to failure of secondary maternal effort.

Excluding those two patients the mean difference was more or less similar among two groups.

The third stage complication like postpartum haemorrhage was more in induced group than in spontaneous group, whereas the study done by James et al showed no significant difference in both groups.⁵

The well-known maternal complications associated with induction of labour like fever, vomiting and hyper stimulation during the labour were found to be highly present in induced labour groups than the spontaneous labour group. Of the 3 complications studied, vomiting was the most common side effect prevalent say 9.3% the induced group and 6.6% in spontaneous labour group.

The percentage of hyper stimulation was 0.2% in spontaneous labour group accelerated with oxytocin and 3.3% in induced women. None of the women in spontaneous group had fever. This is contradictory to the study by James et al where he found no difference in the occurrence of fever between the 2 groups.⁵

Condition of the new born:

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- 1.3% in induced- 2.6%).

CONCLUSION

As per the study patients goes in to spontaneous labour on an average around 38 weeks.

Latent phase of labour is prolonged in induced group when compared to the spontaneous labour group.

In patients with spontaneous labour the duration of active phase was shorter when compared to induced labour.

There was also increase in caesarean section rate 23.3% in induced patients when compared to 1.3% in spontaneous group.

The Apgar scores of the babies at 5 minutes in the spontaneous group were found to be better than the induced group.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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