

COMPARISON OF PROGRESSION OF SPONTANEOUS VERSUS INDUCED LABOR IN PRIMI AND MULTIPAROUS WOMEN

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ABSTRACT

Objectives: The objectives of the study were to compare progression of spontaneous versus induced labor in primigravida and multigravida women.

Methods: Pregnant women admitted in Labor room of Bebe Nanaki mother and Child Care Centre, Amritsar during April 2019–March 2020 were selected for this study. A total of 200 pregnant women were selected and divided into two groups. Women in group A were induced while in group B were women with spontaneous onset of labor. Labor progression in both was compared.

Results: In group A, the mean duration of the active phase in primigravida was 4.08 ± 2.30 h and in multigravida was 4.02 ± 2.20 h. In group B, the mean duration of active phase in primigravidas was 7.24 ± 1.39 h and in multigravidas was 6.48 ± 1.40 h. In group A, the mean duration of the second stage in a primigravida was 25.5 ± 8.15 min and in a multigravida was 17.38 ± 9.95 min. In group B, the mean duration of the second stage in a primigravida was 41.3 ± 9.6 min, while in a multigravida was 22.72 ± 6.2 h.

Discussion: The mean duration of active phase in group A in the primigravida and multigravida was almost similar, showing that induction does not have any effect on the duration of active phase. The mean duration of the second stage of group A in primigravida was 25 min and multipara was 17 min showing that induction reduces the duration of the second stage.

Conclusion: Induction of labor when done at the right gestational age for correct indication is beneficial to women as it reduces the complications caused due to the continuation of high-risk pregnancies.

Keywords: Induction of labor, Multigravida, Primigravida, Spontaneous labor.

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INTRODUCTION

“Induction of labor” is defined as the initiation of uterine contractions before the onset of labor for the purpose of vaginal delivery, while augmentation of labor refers to the stimulation of spontaneous contractions that are considered inadequate because of failed cervical dilatation and fetal descent [1]. Induction of labor is one of the most important tools in the obstetrician's armamentarium with the aim of achieving a successful vaginal delivery when the continuation of pregnancy is a potential threat to the life of the mother and the unborn baby.

Induction is done after assessing the BISHOPS SCORE. In this study, Modified Bishops score was used.

This study was done to determine how the progression of labor in primigravida and multiparous women who presented with spontaneous labor differed from those who are electively induced, using a World Health Organization (WHO) modified partograph. The objective of this study was to

1. To compare progression of spontaneous versus induced labor in primi and multigravida women using WHO partograph
2. To study the advantages and disadvantages of induction of labor.

METHODS

Pregnant women admitted in Labor room of Bebe Nanaki mother and Child Care Centre, Amritsar during April 2019–March 2020 were selected for this study. A total of 200 pregnant women were selected and divided into two groups. In one group, labor was induced by any method (either medical or surgical), while in the other group were women with spontaneous labor and progression of labor in both was

noted on modified WHO partograph. The fetal outcome was noted. The study was conducted after approval from Institutional Ethics Committee, Government Medical College, Amritsar and informed consent from patients was enrolled in the study.

The two groups were managed as follows:

Group A

In women whose bishops score was <6 , induction of labor was done using one of the methods (Prostaglandins E2 (PGE2), PGE1 (Misoprostol), (Balloon Devices: Foley Catheter, Membranes Sweeping).

Group B

Primi and multiparous women who presented with spontaneous onset of labor with a favourable cervix (bishop score >6).

Induction was preferably started early in the morning of the patients who fulfilled the inclusion criteria and had a Bishop score of <6 .

Management of labor

- Labor was monitored using partograph
- Augmentation with oxytocin was done if cervical dilatation was <1 cm/h. Fetal monitoring was done by auscultation
- Facilities for immediate cesarean delivery were kept readily available in case of failed induction or fetal distress.

On admission, initial PV was done and Bishop Score assessed. The patient was allowed to progress on her own. PV was repeated after 4 h or on the rupture of membranes. Partograph was plotted in active phase of labor. In case of PV findings crossing the alert line, labor was augmented with oxytocin.

If the Bishop's score was <5 , induction of labor was done using one of the methods (Prostaglandins-PGE2 gel, PGE1, Foley's catheter, Amniotomy, Membrane stripping). The patient was reassessed if there was draining PV or after 6 h when an intracervical gel was used or after 4 h when PGE1 misoprostol was used.

RESULTS

Out of 100 cases of group A, 78 (78%) cases had delivered vaginally, while 22 (22%) cases had a cesarean delivery. Out of 100 cases of group B, 97 (97%) cases had a normal vaginal delivery (NVD) whereas, 3 (3%) cases had a cesarean delivery Table 1.

Out of 100 cases of group A, 2 (2%) patients had cephalopelvic disproportion (CPD), 4 (4%) patients had failure of progression of labor, fetal distress was seen in 12 (12%) cases and 4 (4%) cases had meconium-stained liquor (MSL) while 78 (78%) patients had NVD Table 2.

Out of 100 cases of group B, 1 (1%) case had CPD, 1 (1%) case had fetal distress and MSL was seen in 1 (1%) case and 97 (97%) patients had a successful vaginal delivery.

Out of 100 cases of group A, the mean duration of active phase of labor was 4.07 ± 2.27 h, out of 100 cases of group B, the mean duration of active phase of labor was 6.9 ± 1.44 h Table 3.

Out of the 100 cases of group A, the mean duration of the second stage of labor was found to be 25.5 ± 18.86 min, while out of the 100 cases of group B, the mean duration of the second stage of labor was 38.15 ± 12.47 min Table 4.

In group A, the mean duration of active phase of labor in a primigravida was 4.08 ± 2.30 h and in multigravidas, it was found to be 4.02 ± 2.20 h Graph 1.

In group B, the mean duration of active phase of labor in a primigravida was 7.24 ± 1.39 h and in multigravidas was 6.48 ± 1.40 h Table 5.

Table 1: Mode of delivery

| Mode of delivery | Group A | Group B | Total |
|------------------|---------|---------|-------|
| NVD | 78 | 97 | 175 |
| LSCS | 22 | 3 | 25 |
| Total | 100 | 100 | 200 |

$p=0.001$, LSCS: Lower segment caesarean section, NVD: Normal vaginal delivery

Table 2: Reason for failure of induction

| Reason for failure of induction | Group A | Group B | Total |
|---------------------------------|---------|---------|-------|
| CPD | 2 | 1 | 3 |
| Failure of progress of labor | 4 | 0 | 4 |
| Fetal distress | 12 | 1 | 13 |
| MSL | 4 | 1 | 5 |

$p=0.003$, CPD: Cephalopelvic disproportion, MSL: Meconium stained liquor

Table 3: Mean duration of active phase

| Active phase | n | Mean \pm SD | Std. error mean |
|--------------|-----|-------------------|-----------------|
| Group A | 100 | 4.07 ± 2.27 h | 0.227 |
| Group B | 100 | 6.90 ± 1.44 h | 0.144 |

Table 4: Mean duration of second stage of labor

| Second stage | n | Mean \pm SD | Std. error mean |
|--------------|-----|-----------------------|-----------------|
| Group A | 100 | 25.25 ± 18.86 min | 1.885 |
| Group B | 100 | 38.15 ± 12.47 min | 1.247 |

Out of group A, the mean duration of the second stage of labor in a primigravida was 25.5 ± 8.15 min and in a multigravida, it was 17.38 ± 9.95 min (Graph 2 and Table 6).

Out of group B, the mean duration of the second stage of labor in a primigravida was 41.3 ± 9.6 min, while in a multigravida, it was 22.72 ± 6.2 h (Graph 2 and Table 6).

Out of 100 cases in group A, the mean appearance, pulse, grimace, activity, and respiration (APGAR) score was 7.42 ± 1.8 , while in 100 cases of group B, the mean APGAR score of the newborn was 8.16 ± 0.6 Table 7.

DISCUSSION

The maternal characteristics differed significantly among the groups with respect to the presence of antenatal complications such as pregnancy-induced hypertension, gestational diabetes mellitus, prelabor rupture of membranes, and intrauterine growth retardation. They were present significantly higher percentage in the induced group, that is, 63%, whereas it was only 31% in induced group.

Our study concluded that women with spontaneous onset of labor had high chances of vaginal delivery than those of induced groups. In our study, out of 100 cases of the spontaneous group, 3% had cesarean delivery while 22% had cesarean section among the induced group. This was in favor of a previous study conducted by Sagarika and Lakshmi, where the rate of cesarean section was about 31% among the patients with induced labor [2]. In a study conducted by Grivell *et al.*, it was concluded that the rate of cesarean section is increased when induction is done for non-recognized indications [3]. A study by Roos *et al.* also observed that there is a fivefold increased risk of cesarean delivery among nulliparous women [4]. Jonsson *et al.* inferred that electively induced labor doubled the risk of cesarean section compared with spontaneous labor onset and the risk was more than tripled when cervical ripening was used [5]. In our study, there was almost seven-fold risk of cesarean section among patients who had induced labor than patients who went into spontaneous labor as there was an increased risk of fetal distress, MSL, and failure of induction.

Table 5: Mean duration of active phase in primigravida and multigravida

| Gravida | n | Mean \pm SD | Std. error mean |
|---------|----|-------------------|-----------------|
| Group A | | | |
| Primi | 78 | 4.08 ± 2.30 h | 0.260 |
| Multi | 22 | 4.02 ± 2.20 h | 0.469 |
| Group B | | | |
| Primi | 55 | 7.24 ± 1.39 h | 0.188 |
| Multi | 45 | 6.48 ± 1.40 h | 0.208 |

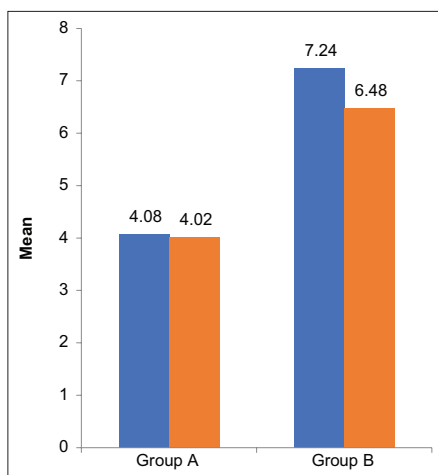
Table 6: Showing mean duration of second stage of labor in primigravida and multigravida

| | Gravida | N | Mean \pm SD |
|---------|---------|----|----------------------|
| Group A | Primi | 71 | 25.51 ± 8.15 min |
| | Multi | 29 | 17.38 ± 9.95 min |
| Group B | Primi | 54 | 41.30 ± 9.60 min |
| | Multi | 46 | 22.72 ± 6.20 min |

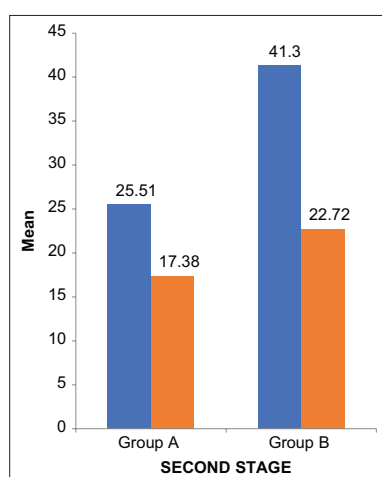
Table 7: The mean APGAR scores of the newborn

| APGAR | n | Mean \pm SD |
|---------|-----|-----------------|
| Group A | 100 | 7.42 ± 1.80 |
| Group B | 100 | 8.16 ± 0.60 |

APGAR: Appearance, pulse, grimace, activity, and respiration



Graph 1: Mean duration of active phase in primigravida and multigravida



Graph 2: Mean duration of the second stage of labor in primigravida and multigravida

The indication for cesarean section was different among the 2 groups. The most common indication for cesarean section among the induced group was fetal distress comprising of 54% among the induced group. This is in contrast to the study conducted by Abisowo *et al.*, where CPD was the most common indication [6].

The mean duration of active phase of labor of the induced group in the primigravida was 4.08 h and multigravida was 4.02 h showing that induction does not have any effect on the duration of active phase of labor. The mean duration of the second stage of labor of the spontaneous group in primigravidas was 41 min and in multipara was 22 min. This was in contrast to findings of the study conducted by Østborg *et al.*, who concluded that active phase of labor was longer in induced than in spontaneous labors in nulliparous women [7].

The mean duration of the second stage of labor of the induced group in primigravida was 25 min and multipara was 17 min showing that induction reduces the duration of the second stage of labor.

APGAR score of the newborn was assessed which determines the success of a delivery. The mean APGAR score of the newborn in the spontaneous group was about 8.1, whereas the mean APGAR score in the induced group was 7, which shows that the newborn of the spontaneous group has a better score than the newborn of the induced group. This was in contrast to the findings of the study conducted by Singh *et al.* [8]. The studies conducted by Patel *et al.* [9] and Yadav *et al.* [10] who showed that

there was no significant difference in the APGAR scores of the two groups.

So taking into account of both maternal and fetal outcomes, there is a strong association between cesarean delivery rate and induction of labor, compared to spontaneous labor. Induction did not increase perinatal morbidity and mortality. Correct choice of mode of induction, monitoring the fetus and mother during intrapartum period vigilantly plays a crucial role in the outcome.

CONCLUSION

Induction of labor, when done at the right gestational age, for a correct indication, is beneficial to the women as it not only reduced the anxiety among the women and her relatives but also reduces the complications caused due to the continuation of high-risk pregnancies.

To conclude, induction of labor is associated with a shorter active and second stage of labor in primigravidas, but this difference was not significantly seen in multiparous women. Induction of labor is also associated with an increased risk of cesarean section, the most common indication for cesarean being fetal distress. Increased rate of cesarean deliveries in the induced group may also be due to the fact that this group included the patients who were high risk and had comorbidities such as hypertension, preeclampsia, postdated, and Rh -ve pregnancy.

APGAR scores of the newborn of the spontaneous group were better in comparison to the induced group.

AUTHORS' CONTRIBUTIONS

Dr. Anita Madan and Dr. Sujata Sharma conceived the idea of this study "COMPARISON OF PROGRESSION OF SPONTANEOUS VERSUS INDUCED LABOR IN PRIMI AND MULTIPAROUS WOMEN." Dr. Yashasvini developed the theory and performed the computations. Dr. Anita Madan and Dr. Sujata Sharma verified the analytical methods. Dr. Jagdeep Kaur encouraged Dr. Yashasvini to investigate and supervised the findings of the work. All authors discussed the results and contributed to the final manuscript.

CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

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