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Original Research Article

A comparative study of spontaneous versus induced labor in primi and multiparous women at tertiary care centre

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ABSTRACT

Background: 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 RNT medical college Udaipur during January 2021 to June 2021 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 labour. Labor progression in both was compared.

Results: In group A, the mean duration of active phase in primigravida was 4.08+2.30 hr. 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 second stage in a primigravida was 41.3+9.6 min, while in a multigravida was 22.72+6.2h. 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 multigravida were 17 min showing that induction reduces the duration of the second stage.

Conclusions: 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: Primigravida, Multigravida, Induction of labor

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 for 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 the study, modified bishops score was used. This study was done to determine how the progression of labor in primigravida and multigravida women who presented with spontaneous labor differed from those who are electively induced, using a world health organization (WHO) modified partograph. The objectives of this study were to compare progression of spontaneous versus induced labor in primi and multigravida women using

WHO partograph and to study the advantages and disadvantage of induction of labor and its outcome.

METHODS

Pregnant women admitted in labor room of RNT medical college Udaipur during January 2021 to June 2021 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 two groups were managed as follows: Group A; in women whose bishops score was <6, induction of labour was done using one of the methods (prostaglandins E2 (PGE2), PGE1 (misoprostol), balloon device: foley’s catheter, membrane sweeping), Group B; Primi and multiparous women who presented with spontaneous onset of labor with a favourable cervix (bishop>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 <1cm/hr. 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 hr or on the rupture of membranes. Partograph was plotted in the active phase of labor. In case of PV findings crossing the alert line, labor was augmented with oxytocin. If the Bishops score was <6, 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 6hr when an intracervical gel was used or after 4h when PGE1 misoprostole was used.

Statistical analysis

Descriptive statistical analysis has been carried out in this study. Results on continuous measurements are presented on mean±SD and results on categorical measurements in number (%). A p value of less than 0.05 was considered significant for the purpose of result analysis. Student t test, Chi-square test have been used to calculate the p value and data was analysed using SPSS.

RESULTS

Out of 100 cases of group A, 72 (72%) cases had delivered vaginally, while 25 (25%) cases had a cesarean delivery, 3 (3%) cases had a instrumental delivery. Out of 100 cases of group B 94 (94%) cases had a normal

vaginal delivery (NVD) whereas, 5(5%) cases had a cesarean delivery, 1 (1%) case had instrumental delivery (Table 1).

Table 1: Mode of delivery.

Variables	Group A	Group B	Total
NVD	72	94	166
LSCS	25	5	30
Instrumental	3	1	4
Total	100	100	200

Out of 100 cases of group A, 2 (2%) patients had cephalopelvic disproportion (CPD), 5 (5%) patients had failure of progression of labor, fetal distress was seen in 14 (14%) cases and 3 (3%) cases had meconium-stained liquor (MSL), 2 (2%) cases had prolonged labour due to abnormal uterine action while 72 (72%) patients had NVD (Table 2).

Table 2: Reason for failure of induction of labour.

Reason	Group A	Group B	Total
CPD	2	1	3
Failure of progress of labour	5	0	5
Fetal distress	14	1	15
MSL	3	1	4
Prolonged labour due to abnormal uterine action	2	1	3
Total	26	4	30

Out of 100 cases of group B, 1 (1%) case had CPD, 1 (1%) had fetal distress, 1 (1%) had MSL, 1 (1%) prolonged labour due to abnormal uterine action and 94(94%) 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).

Table 3: Mean duration of active phase.

Active phase	N	Mean±SD (hours)	SEM
Group A	100	4.07±2.27 hr	0.227
Group B	100	6.90±1.44 hr	0.144

Table 4: Mean duration of second stage of labor.

Second stage of labor	N	Mean±SD (minutes)	SEM
Group A	100	25.25±18.86	1.885
Group B	100	38.15±12.47	1.247

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 minutes, while out of the 100 cases of group B, 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. 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 5: Mean duration of active phase in primigravida and multigravida.

Groups	N	Mean±SD	SEM
Group A			
Primi	75	4.08±2.3hr	0.260
Multi	25	4.02±2.20hr	0.469
Group B			
Primi	58	7.24±1.39hr	0.188
multi	42	6.48±1.40hr	0.208

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

Table 6: Mean duration of second stage of labor in primigravida and multigravida.

Groups	Gravida	N	Mean±SD (minutes)
Group A	Primi	75	25.51±8.15
	Multi	25	17.38±9.95
Group B	Primi	58	41.30±9.60
	Multi	42	22.72±6.20

Table 8: Incidence of PPH according to mode of delivery in both groups.

Mode of delivery	Group A	Incidence of PPH	Group B	Incidence of PPH
NVD	72	3	94	1
LSCS	25	3	5	1
Instrumental delivery	3	1	1	0
Total	100	7	100	2

Current 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, 5% had cesarean delivery while 25% had cesarean section among the induced group.² This was in favor of a previous study conducted sagarika and lakshmi, where the rate of cesarean section was about 31% among the patients with induced labor. 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. 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 50% 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 ostborg et

Table 7: Mean APGAR scores of the newborn.

APGAR	N	Mean APGAR score
Group A	100	7.42±1.80
Group B	100	8.16±0.60

Out of 100 cases incidence of PPH in group A was 7% in which 3% in NVD, 3% in LSCS, 1% in instrumental delivery, in group B incidence of PPH 2% in (Table 8). Out of 100 cases in group A 95% cases had no complications whereas 3% cases had birth asphyxia, 1% case had septicemia/RDS, 1% case had other complications while in group B 99 (99%) cases had no complication, 1% case had birth asphyxia in (Table 9).

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 spontaneous group.

al., who concluded that active phase of labor was longer in spontaneous than in induced labors in nulliparous women.⁷

Table 9: Distribution of cases according to neonatal complications.

Variables	Group A	%	Group B	%
No complication	95	95	99	99
Birth asphyxia	3	3	1	1
ICH	0	0	0	0
Septicaemia/RDS	1	1	0	0
Others	1	1	0	0

The mean duration of the second stage of labor of the induced group in primigravida was 25 min and multigravida was 17 min showing that induction reduces the duration of 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 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 and Yadav et al who showed that there was no significant difference in the APGAR scores of the two groups.^{9,10} Incidence of PPH also higher in induced group as compare to spontaneous group. When compare both groups the incidence of neonatal complication also slightly higher in induced group as compare to spontaneous 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.

Limitations

Limitations of current study were; women with previous CS who tried TOLAC was not clear, level of prematurity was not assessed, malpresentation, malposition and multiple pregnancies not included in the study. There is need of long-term observation of patient with partograph.

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. Incidence of PPH & neonatal complications also higher in induced group as compare to spontaneous group.

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