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Research Article

To Study the Fetomaternal Outcome and Progress of Labour among Induced versus Spontaneous Labour in Nulliparous Women (Using Modified WHO Partograph)

Gupta Suchika[1*], Shekhawat Usha[2], Mital Premlata[3], Meena Madhu[4]
[1]Senior Resident, [2]Senior Professor and Unit Head, [3]Senior Professor, [4]Ex PG Student; Department of Obstetrics and Gynaecology, S.M.S. Medical College, Jaipur-302012, Rajasthan, India

***Corresponding author**
Dr. Suchika Gupta
Email: suchika14@yahoo.in

Abstract: The objective of this study was to compare the progress and outcome of induced versus spontaneous labour among nulliparous women using the modified WHO partograph. It was a study comparing nulliparous women with induced labour and those with spontaneous onset of labour, monitored by using modified WHO partograph. 145 women with term singleton pregnancy were included in each group. Outcome measures were the mean duration of labour, mode of delivery and the feto-maternal outcomes. There was no difference in the mean age in two groups. More women had spontaneous vaginal delivery among those with spontaneous labour (88.96% versus 80%) (p=0.0396). The mean duration of second stage of labour was significantly more in induced labour (16.34 minutes) than in spontaneous labour (14.72 minutes) (p=0.0212). The mean duration of latent phase was significantly reduced in induced (5.34 hours) as compared to spontaneous group (6.82 hours) (p=0.00). The mean APGAR scores were comparable in two groups. Induced labour is comparable to spontaneous labour regarding fetomaternal outcomes but with increased rate of caesarean deliveries.
Keywords: Induced labour, Spontaneous labour, Nulliparous women, WHO partograph

INTRODUCTION

Labour is a natural physiological process characterized by progressive increase in frequency, intensity and duration of uterine contractions resulting in effacement and dilatation of the cervix with descent of the fetus through the birth canal. This physiological process may at times become pathological. Failure to recognize would result in prolonged labour with resultant increase in the intensity in the morbidity and mortality of both the fetus and mother.

According to most authorities, the best way to monitor labour is with the help of a partograph. Partogram is a composite graphical record of key data (maternal and fetal) during labour entered against time on a single sheet of paper. Relevant measurements include statistics such as cervical dilation, fetal heart rate, duration of labour and vital signs. An accurate record of the progress in labour can be obtained by it. Any delay or deviation from normal may be detected quickly and treated accordingly [1].

In present age the obstetrician as well as woman in labour would prefer the delivery to be accomplished in shortest possible time, compatible with safety of mother and baby. Hence the hopeful expectancy is replaced by an active management of labour. Partogram can be used as a useful aid for this purpose.

Data from the National Centre for Health Statistics for the last decade indicate that the rate of labor induction has increased many fold. Reasons 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 FDA approved cervical ripeners, more released attitudes towards marginal or elective inductions and litigious constraints [2].

As induction has both advantages and disadvantages this study was undertaken to compare the maternal and fetal outcomes of both induced and spontaneous labour using modified WHO partograph.

METHODOLOGY

This hospital-based comparative study was done to compare the fetomaternal outcomes and progress of labour (using modified WHO partograph) in spontaneous and induced labour in Zenana Hospital, SMS Medical College, Jaipur from Sept 2011 to August 2012 involving nulliparous women in active phase of

labour with cervix at least 4 cm dilated. The two study groups were: - Spontaneous labour group (Group-A) and Induced labour group (Group-B). 145 nulliparous women with term, singleton live fetus with vertex presentation were included in each group in the study after excluding bad obstetrics history, placenta previa, cephalopelvic disproportion, preexisting fetal distress or IUGR.

Outcome measures included the mean duration of labour, eventual mode of delivery and the fetomaternal outcomes.

RESULTS

Mean age in Group A and Group B was 21.87 ± 2.365 years and 22.04 ± 2.194 years respectively. No statistical difference was observed (P = 0.5373) (Table 1).

Women in spontaneous labour group have higher chances of spontaneous vaginal delivery than in induced labour group. The rate of primary caesarean sections in spontaneous group was 11.04% in Group A whereas it was 20% in Group-B. 88.97% women in Group-A underwent spontaneous vaginal delivery as compared to 80% in Group-B. This difference was statistically significant (p value = 0.0396) (Table 2).

The mean duration of latent phase of labour was 6.82 ± 2.44 hours in spontaneous group (n = 96) whereas it was less, 5.34 ± 1.94 hrs, in the induced group (n = 117) (p = 0.00). The mean duration of active labour was 3.42 ± 1.44 hours in Group-A and 3.58 ± 1.71 hours in Group-B (p = 0.436). In the present study it was found that the mean duration of second stage of labour was 14.72 ± 3.94 minutes in spontaneous labour group and 16.34 ± 6.70 minutes in induced labour group (p = 0.0212) (Table 3).

2.74% women in Group-B suffered perinatal trauma as compared to 1.37% in Group A. The difference was statistically not significant (p = 0.409). The incidence of postpartum haemorrhage and need for blood transfusion was same in both groups 2.06% and 1.37% respectively. There were 2 cases of hyperstimulation in induced labour group which is a known possible complication of induction of labour (Table 4).

Mean 1 minute APGAR score was 7.38 ± 1.17 in Group-A and 7.86 ± 0.99 in Group B. The mean 5 minute APGAR score was 8.09 ± 1.19 in group-A as compared to 8.45 ± 0.949 in Group-B. The difference was statistically not significant (Table 5).

Table -1: Distribution of Cases According to Age

Age Group (in years)	Group-A		Group-B	
	Number	%	Number	%
16 – 20	50	34.48	40	27.58
21 – 25	84	57.93	94	64.82
26 – 30	11	7.58	11	7.58
31 – 35	0	0.00	0	0.00
Total	**145**	**100.00**	**145**	**100.00**

Mean Age (Group-A) = 21.87 ± 2.365 years
Mean Age (Group-B) = 22.04 ± 2.19 years
P-value = 0.537 (Not Significant)

Table- 2:Distribution of Cases According to Mode of Delivery

Mode of Delivery	Group-A		Group-B	
	Number	%	Number	%
Normal	129	88.97	116	80.00
LSCS	16	11.03	29	20.00
Total	**145**	**100.00**	**145**	**100.00**

P-value = 0.0396 (Significant)

Table – 3: Distribution of Cases According to Mean Duration of Latent Phase, Active Phase and Second Stage of Labour

	Group	N	Mean	SD	P-value
Latent Phase (hours)	**A**	96	6.82	2.44	0.00
	B	117	5.34	1.94	
Active Phase (hours)	**A**	133	3.38	1.44	0.436
	B	118	3.58	1.71	
Second Stage (minutes)	**A**	127	14.72	3.94	0.0212
	B	116	16.34	6.70	

Table- 4: Distribution of Cases According to Maternal Complications

Maternal Complications	Group-A		Group-B	
	Number	%	Number	%
Hyperstimulation	0	0.00	2	1.37
Perineal Trauma	2	1.37	4	2.74
Postpartum Haemorrhage	3	2.06	3	2.06
Need for Blood Transfusion	2	1.37	2	1.37

P-value (Perineal Trauma) = 0.409 (Not Significant)

Table- 5: Distribution of Cases According to Mean APGAR Score at 1 and 5 Minutes

Groups	APGAR Score at 1 Minute		APGAR Score at 5 Minute	
	Mean	Standard Deviation	Mean	Standard Deviation
A	7.38	1.17	8.09	1.19
B	7.86	0.99	8.45	0.949

DISCUSSION

Induced or spontaneous labour has implications on the eventual mode of delivery and maternal as well as neonatal outcome. The objective of the study was to compare the progress of labour and outcome of spontaneous v/s induced labour among nulliparous women using Modified WHO Partograph. The study revealed pertinent findings which are very useful in labour management among nulliparous women.

Rate of caesarean section was significantly higher in induction of labour group than in spontaneous labour (20% v/s 11.04%) in our study. Our finding was consistent with the study done by like Barbara et al (2012)[1] 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*. [3] 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*. [4] 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 latent phase was significantly lower in induced labour than in spontaneous group (6.82 ± 2.44 v/s 5.34 ± 1.94). Our finding was in contrast to the study done by Harper *et al*. [5] who concluded that the time to progress 1 cm dilatation in latent labour was significantly longer in women who were induced compared with women who experience spontaneous labour. The mean duration of active phase in induced labour and spontaneous labour was comparable and statistically not significant (3.58 ± 1.71 v/s 3.38 ± 1.44hrs). Our finding was in contrast to the finding observed by Hoffman *et al*. [4] 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*. [5] who concluded that the median time to progress 1 cm dilatation in active labour was similar in spontaneous and induced labour. The mean duration of second stage of labour was 14.72 ± 3.94 and 16.34 ± 6.77 min in spontaneous and induced group respectively. The difference although seems minor but statistically significant (p value – 0.02) but Jana Kiraman U *et al*. [6] in their study found that there was no significant difference in length of the second stage of labour in spontaneous and induced group.

Occurance of perineal trauma was more in induced than spontaneous labour group similar results were observed in the study by Glaucia *et al*. [7] published in WHO Bulletin 20116 there was a 1.24 relative rate (1.93-18.13) (95% Confidence Interval) for perineal trauma in induced labour group than in spontaneous labour group. Also the relative rate for need for blood transfusion was 1.74 with 95% Confidence Interval (1.06-2.85) and for postpartum haemorrhage, relative rate was 1.15 times with 95% Confidence Interval (0.52-2.69) in induced labour group than in women labouring spontaneously. Janakiraman [6] also had the observation that the incidence of postpartum haemorrhage in induced group was more 4.2% compared with 2% in spontaneous labour group. In our study occurrence of postpartum haemorrhage and need for blood transfusion was same in both the groups.

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*. [8] 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*. [9] 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 scores in his study was 8.93 ± 1.87 in Group-A and 9.45 ± 1.10 in induced group ($p = 0.008$).

CONCLUSION

From the above study we conclude that induction of labour when compared with spontaneous labour at term, does not affect the maternal or neonatal outcome in carefully selected patient population. However, the increased risk of caesarean section posed by induction of labour should be a part of informed consent discussion with a patient who needs induction. The patient may very well choose to delay, avoid or accept induction. Induction of labour is a safe procedure if the labour is partographically monitored.

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