

A randomized comparative study of progress of labour amongst spontaneous and induced labour in term pregnancy primigravida by using modified WHO partograph

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Abstract

Background: Pregnancy extending after 37 weeks poses risk to neonates in terms of their survival and other complications. When it is risky to continue pregnancy, induction of labour is done which is artificial initiation of uterine contraction prior to its spontaneous onset. This study aimed to compare the progress of labour between nulliparous women with spontaneous labour and in whom labour was induced. **Methods:** Primigravida females admitted in labour room at term, were divided into Spontaneous and Induced labour group after reaching cervical length at least 4 cm. Both the groups were monitored according to modified WHO partograph and compared for progress of labour. **Results:** Total 180 females were compared with 90 in each group. Cases falling between alert line and action line in the cervicograph were significantly more in Induced Group ($p < 0.05$). Mean duration of labour was more in Spontaneous group which was significant in 1st stage and 2nd phase. There was no significant difference between postpartum stay in hospital in both the group ($p > 0.05$). **Conclusion:** We concluded from this study that though requirement of augmentation for progress of labour was found significantly more in induced group but duration of labour was shorter in induced labour when monitored with modified WHO partograph.

Keywords: Induced labour, spontaneous labour, primigravida, modified WHO partograph

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Introduction

Obstetrics is concerned with two lives, the mother and the foetus as it deals with pregnancy and child birth and also post-partum period. Most of the women during their reproductive years are healthy and have an uncomplicated delivery of a healthy baby at term with spontaneous onset of labour. Childbirth is the period from the onset of regular uterine contraction until expulsion of placenta. The process by which this normally occurs is called labour. WHO defines normal birth as: spontaneous in onset, low risk at the start of labour and remaining so throughout labour and delivery.[1] When the situation arises to interrupt the pregnancy in the interest of mother or foetus or both, where the continuation of pregnancy will pose an adverse outcome for mother and child, induction of labour is one of the means. It is among the most common obstetric interventions being done now;[1] recent studies shows that it is carried out in 32.1% of pregnancies in India.[2,3] A successful, induction of labour should result in adequate uterine contractions and progressive dilatation of cervix, followed by vaginal delivery and not a mere preparation for caesarean section and results in viable pregnancies. These aims must be achieved with minimum discomfort and risk to both mother and foetus.[4] As perinatal mortality and foetal compromise increase progressively with gestation beyond 37 weeks, induction of labour between 37 and 41 weeks has the potential to improve neonatal outcomes. There are potential medical advantages to induction of labour at full term, such as reduction in stillbirth and further foetal

growth, which leads to macrosomia and its consequences, development of preeclampsia, and oligohydramnios. Moreover induction of labour may also result in increase in maternal or perinatal morbidity.[4-6] Randomized, controlled trials have compared the rates of caesarean delivery between women with induction of labour and those with expectant management of pregnancy and have concluded that the caesarean rate was unchanged or lower among the Induced group.[7,8] However, there is no adequate trial or metaanalysis available to examine the effect of induction of labour between 37 and 41 weeks gestation on perinatal mortality.[9,10] Also there is scarcity of literature comparing Spontaneous versus Induced labour among nulliparous women. With this background, the present study was conducted to determine the progress of labour amongst Spontaneous versus Induced labour in Primigravida using modified WHO partograph at a tertiary care teaching hospital in Rajasthan.

Materials and methods

A hospital based prospective study was conducted for a period of 1 year. A sample size of 180 was calculated by using Open Epi software version 3.01. Ethical clearance was taken from Institutional Ethics Committee before starting the study and prior written informed consent was taken from all the participants before recruiting them. A semi structured questionnaire was designed to collect data on the required variables. The questionnaire was scrutinized by the faculty of the department and necessary changes were made for preparing the finalized proforma.

Women with full term pregnancy coming to the labour room of the hospital during the study period were recruited in the study. All women were screened for eligibility criteria i.e., the female should be Primigravida having a live singleton term pregnancy with vertex presentation. Women aged > 35 years, multiple pregnancy,

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malpresentation, abdominal pregnancy, placenta praevia or previous scars on uterus, who had undergone infertility treatment and any cases referred as intrapartum and postpartum were excluded from the study.

Modified Bishop's Score was estimated of all the females. The study population was divided into two groups. Females with ≥ 4 cm dilatation were considered as Spontaneous Group. Females with < 4 cm dilatation were Induced with 25mcg Misoprostol per vaginally and repeated as per the protocol. Again, those with < 4 cm cervical dilatation after induction were excluded and with ≥ 4 cm cervical dilatation was kept in Induced Group. Progress of delivery was monitored using Modified WHO partograph, assessment for requirement of augmentation was done. Maternal outcomes were observed which included mode of delivery, duration and complications of stages of labour, admission to the ICU, duration of postpartum stay in hospital and maternal status at discharge. Neonatal complications were also noted. The data was entered into Microsoft Excel 2007 spread sheet. Final analysis was done using

SPSS for Windows 20.0 version. Variables were described by percentage distribution. Continuous variables like age, duration, birth weight, postpartum stay was described by mean and SD. Between groups comparisons was done by Chi-squared test and Mid-P exact test. Significant outcomes were subjected to multivariate analysis of binary logistic regression. P-value < 0.05 was considered as significant difference.

Results

In the present study total 180 females participated with 90 females in each Induced Group and Spontaneous Group. Mean age of females in Induced group was 24.62 ± 2.82 years while that of the Spontaneous group was 24.42 ± 2.64 years. This difference was statistically not significant ($p > 0.05$). Mean gestational age of Induced group was 40.84 ± 0.83 weeks while that of the Spontaneous group was 40.9 ± 0.87 weeks with p value > 0.05 . [Table 1]. Cases falling between alert line and action line in the cervicograph were significantly more in Induced Group with p value < 0.05 . [Table 1]

Table 1: Demographic profile and other characteristics in Induced and Spontaneous Groups

	Induced Group (N = 90)	Spontaneous Group (N=90)	p value
Age in years(Mean \pm SD)	24.62 \pm 2.82	24.42 \pm 2.64	> 0.05
Gestational age in weeks(Mean \pm SD)	40.84 \pm 0.83	40.9 \pm 0.87	> 0.05
Cases falling between alert line and action line (%)	55 (61.1)	35 (38.9)	$< 0.05^*$

*significant

Mean duration of active phase of 1st stage in Induced group was 5.77 ± 2.02 hours and that of 2nd stage was 1.33 ± 0.67 hours while in Spontaneous group it was 6.46 ± 1.96 hours and 1.71 ± 0.86 hours respectively. The difference was significant statistically ($P < 0.05$). Mean duration of 3rd stage in Induced group was 5.53 ± 2.74 minutes and in Spontaneous group was 5.90 ± 4.21 minutes. Difference in duration of 3rd stage between the groups was not found significant statistically. [Table 2] In Induced group the mean postpartum stay was more 3.15 ± 1.17 days versus 2.91 ± 1.14 days in Spontaneous group and it was not statistically significant ($p > 0.05$). [Table 2]

Table 2: Progress of labour in Induced and Spontaneous Groups

		Induced Group(N=90)	Spontaneous Group (N=90)	p value
Duration of various stages of labour (Mean \pm SD)	1 st stage (hrs)	5.77 \pm 2.016	6.46 \pm 1.96	$< 0.05^*$
	2 nd stage (hrs)	1.33 \pm 0.67	1.71 \pm 0.86	$< 0.05^*$
	3 rd stage (mins)	5.53 \pm 2.74	5.90 \pm 4.21	> 0.05
Postpartum stay in Hospital(Mean \pm SD) days		3.15 \pm 1.17	2.91 \pm 1.14	> 0.05
Birth Weight in grams(Mean \pm SD)		3058.11 \pm 380.51	3038.11 \pm 362.23	> 0.05

*significant

One case in each group i.e. total 2 (1.1%) had a complication of both meconium-stained liquor and non-reassuring foetal heart rate. Complications occurring during 1st Stage of labour viz. meconium-stained liquor, non-reassuring foetal heart rate and abruption in 1st stage were compared between Induced group and Spontaneous group; the difference was not found significant statistically ($p > 0.05$). Foetal distress and prolongation of 2nd Stage were higher in Induced group and difference between the two groups was found to be insignificant statistically ($p > 0.05$). [Table 3]

There was no significant difference in number of complications during 3rd stage and neonatal complications among the two groups.

Table 3: Maternal complications in Induced and Spontaneous Groups

		Induced Group (N=90)	Spontaneous Group (N=90)	p value
Complications during 1 st stage (%)	Meconium stained liquor	4 (4.4)	2 (2.2)	> 0.05
	Non reassuring Foetal Heart rate	8 (8.9)	3 (3.3)	> 0.05
	Meconium stained liquor, Non reassuring Foetal Heart rate	1(1.1)	1 (1.1)	> 0.05
	Non reassuring Foetal Heart rate, Abruption	2 (2.2)	0	> 0.05
Complications during 2 nd stage (%)	Foetal distress	4 (4.4)	2 (2.2)	> 0.05
	Prolonged 2 nd Stage	3 (3.3)	1 (1.1)	> 0.05

Discussion

The present study was conducted in a tertiary care institute of Rajasthan on 180 women of the age between 20 years to 50 years. Progress of labour in primigravidae was monitored using WHO modified partograph. No significant difference in the mean age and gestational age of females in both the groups was observed i.e. both

the groups were comparable which promises reliability of study findings. Cases falling between alert line and action line in the cervicograph were significantly more in Induced Group which was supported by other studies.[4,11,12] But these factors didn't affect maternal and foetal outcome. The mean time of active phase of 1st stage and mean duration of 2nd stage in Induced group was found

significantly shorter as compared to Spontaneous group which is in accordance to study by Osmundson et al.[13] This may be due to the fact that while in present study the modified WHO partograph was utilized in which plotting is commenced at cervical dilatation of at least 4 cm, the previous study utilized the old partograph which have both latent and active phase of labour.

However, the fact that the mean total duration of labour was shorter in Induced labour group versus Spontaneous labour advocates that Induced labour is not always accompanied with extended duration of labour which was not seen in previous studies.^[14] The possible explanation for this could be with the help of partograph progress of labour can be monitored and it warns for slow progress of labour so early detection and management is possible. Over all there was no significant difference in the mode of delivery among the two groups but number of normal delivery was higher in Spontaneous group. Literature findings also revealed similar finding.^[15] Another study by Murlidhar et al,^[16] found that when cervical dilatation was on the left of the alert line, more vaginal deliveries occurred compared to those, whose cervical dilatation moved between alert and action line or crossed or reached action line. Higher mean duration of postpartum stay in hospital in Induced group could be also due to lesser number of normal deliveries. Total number of maternal complications during 1st and 2nd stage of labour was seen more in Induced group than in Spontaneous group but the difference was not significant statistically. Maternal complications like non-reassuring foetal heart rate and meconium stained liquor during 1st stage was seen more in Induced labour which were in accordance with previous studies.^[13,17,18] More frequent occurrence of meconium in the Induced group could be possibly attributed to active management of labour in Induced group. Moreover, study by Darney et al also affirms more number of 2nd stage complications; prolonged 2nd stage of labour and Fetal distress in Induced groups like the present study.^[19] In this study there was no significant difference in the number of complications occurring during 3rd stage of labour in both the groups. There was also no significant difference in number of neonatal complications among the two groups.

Conclusion

We concluded from this study that though requirement of augmentation for progress of labour was found significantly more in induced group but duration of labour was shorter in induced labour when monitored with modified WHO partograph. The findings of this study might be useful in successful conduction of labour in primigravida females.

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