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A Prospective Comparative Study of Modes of Delivery in between induced and spontaneous labour

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Abstract

Background: The majority of women in their reproductive years are in good health, giving birth to healthy babies at term with spontaneous Labor. In situations where the mother, fetus, or both need the pregnancy to end because continuing the pregnancy would be harmful to both the mother and the unborn child, inducing Labor is one option.

Aim and objective: To study the mode of delivery and need of augmentation in women with induced labor as compared to those who go in spontaneous labor.

Methodology: The clinical trial was conducted for period of 2 years in OBGY department of Bharati Vidyapeeth University Pune. 218 pregnant women were included in study and divided into two group A and B. Modes of delivery and need of augmentation data collected, data analysis was done and appropriate statistical tests were applied.

Results: There were 150(68.8%) normal deliveries, followed by 33(15.1%) cesarean sections, 31(14.2%) using vacuum and among 4(1.8%) forceps were used. Out of total 218 augmentation was required in 87 patients (39.9%).

Section rate in induced group was 28.44% and in spontaneous group was 1.83%

Conclusion: There were significantly more cesarean sections in induced labor group compared to spontaneous labor group. While rate of normal deliveries was more in spontaneous group than induced. The distribution of forceps deliveries and vacuum deliveries were almost similar in both the groups.

Keywords: Labour Induction; Spontaneous Labour; Caesarean Section; Augmentation.

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Introduction

A natural physiological process called Labor is characterized by a gradual increase in the frequency, intensity, and duration of uterine contractions. This causes the cervix to efface and enlarge as the fetus descends through the birth canal.[1]

Prior to their natural on set, uterine contractions can be artificially started in a quiescent uterus to prepare for vaginal delivery using any technique, including medical, surgical, or a combination of both. One of the most frequent procedures during

pregnancy is Labor induction.

The proportion of cases of induction of Labor compared to spontaneous Labor has been rising steadily and significantly around the world. Over the past ten years, Labor induction has become more common. Labor induction may be requested or chosen for non-medical or social reasons, or it may be indicated by medical or obstetrical complications of pregnancy.[2,3]

When the advantages of a quick delivery out weigh the risks of delaying the delivery, induction of Labor is a viable therapeutic option. Rates of induction of Labor vary from region to region, increasing gradually until incidence in some developed countries nearly doubles.[4-6]

Bishop's Score can be used to measure cervical re modeling, and the cervical condition at the time of Labor induction. A patient with a low Bishop's score less than three is generally expected to have a higher failure rate for induction; the alternative is a caesarean section, which could negatively impact the method of delivery. The indication of induction of Labor must be justified because it is linked to higher rates of C-sections, maternal fever, chorioamnionitis, and fetal asphyxia.[7]

Compared to spontaneous Labor, induction is linked to more complications. The advantages of inducing Labor must be weighed against any possible risks to the mother or the fetus. Due to the fact that induction has both benefits and draw backs, it is important to compare and contrast both induced and spontaneous Labor as well as the mode of delivery.[8]

Therefore, the current study was designed with the goal of comparing the mode of delivery as well as the out comes for the mother and the fetus between patients who spontaneously went into Labor and those whose Labor was induced at a tertiary care teaching hospital.

METHODOLOGY

A prospective comparative study was conducted in the department of obstetrics and gynecology of Bharati Vidyapeeth (deemed to be) university, Pune overa period of 2 years in antenatal females coming for delivery.

Inclusion criteria:

For spontaneous labor

- Singleton Pregnancy
- Reactive fetal heart rate pattern Completed 37 weeks

For induction of labor

- Singleton Pregnancy
- Reactive fetal heart rate pattern completed 37 weeks Preeclampsia
- Mild oligohydramnios, Post datism
- PROM

Exclusion criteria:

- Multiple gestations
- Breech and other abnormal presentation Placenta previa
- Abruptio placenta Preterm
- Previous LSCS
- Severe oligohydramnios Cord prolapse

Sample size

During the study period, a total of 218 patients were included in the study 109. patients in the spontaneous on set of labor and 109 patients in induced labor.

Methodology

- After obtaining detailed history and thorough examination, the patients were allocated in *Group A* (Spontaneous labor) n=109 *Group B* (Induced labor), n=109.
- The induction was done by any method medical, surgical, or combined.
- Both group Patients were monitored for painful uterine contractions with respect to the number, duration, and frequency and the Fetal heart rate were monitored every half -hourly, progress of labor were observed in both group patients.
- The need of augmentation, mode of delivery was observed.

Plan of data analysis

- All the subjects were observed during and after delivery.
- The collected data was coded and entered in Microsoft Excel sheet.
- The data was analyzed using SPSS (statistical package for social sciences) version 20.0 software.
- The results were presented in a tabular and graphical format.
- For qualitative data, percentages and ratios were calculated.

- As applicable for qualitative data, test like chi-square test were used for comparison of variables used in the Study.

RESULTS

A total of 218 pregnant women were included in the present study. The meanage of the patients was 26.43 ± 4.04 years, ranging between 19 to 37 years. The mean of gestation age was 38.61 ±1.17weeks, ranging between 37 to 41 weeks. The mean weight of the baby was 2.91±0.34 kgs, ranging from 2.2 to 3.83kgs. The mean±S D values of age, gestational age and baby weigh are shown in table 1.

Table 1: Mean values of age, gestational age and baby weight

	Mean	SD	Minimum	Maximum
Age	26.43	4.04	19.00	37.00
Baby weight	2.91	0.34	2.2	3.83
Gestational age	38.61	1.17	37.00	41.00

Majority 121 (55.5%) had gestational age between 38 to 40 weeks, followed by 51 (23.4%) with gestational age of less than 38 weeks and 46 (21.1%) with gestational age of more than 40 weeks.

The distribution of was equal for induced and spontaneous labor with 109 (50%) women in each group.

Out of total 218, there were 87 (39.9%) cases augmentation was required. Among those 87 deliveries, 46 were in induced labor group and 41 in spontaneous labor group.

There were 150(68.8%) normal deliveries, followed by 33(15.1%) cesarean sections, 31(14.2%) using vacuum and among 4(1.8%) forceps were used.

Majority of babies 118(54.1%) belonged to weight category between 2.5 to 2.99 kgs, followed by 81 (37.2%) with birth weight of ≥3.0 kgs and 19(8.7%) were with birth weight of <2.5 kgs.

All of the following data has been depicted in table no 2.

Table 2: Data of gestational age, parity, type of delivery, need of augmentation, mode of delivery and baby weight

		Frequency	Percent
Gestational age	<38	51	23.4
	38-40	121	55.5
	>40	46	21.1
Parity	Primipara	113	51.83
	Multipara	105	48.17
Type of delivery	Induced	109	50
	Spontaneous	109	50
Need of augmentation	No	131	60.1
	Yes	87	39.9
Mode of delivery	C- Section	33	15.1
	Forceps	4	1.8
	Normal	150	68.8
	Vacuum	31	14.2
Baby weight	<2.5	19	8.7
	2.5-2.99	118	54.1
	≥3.0	81	37.2

The association between the modes of delivery and type of labor was assesse dusing Chi-square test. There was significant ($p<0.001$) difference in the distribution of patients according to mode of delivery and type of labor reported. There were significantly more cesarean sections in induced labor group compared to spontaneous labor group. While rate of normal deliveries was more in

spontaneous group than induced. The distribution of forceps deliveries and vacuum deliveries were almost similar in both the groups.

The association between the birth weight category and type of labor was assesse dusing Chi -square test. The distribution of patients did not differ significantly (p=0.171) between the groups based on birth weight category and type of labor reported. Although there were more number of babies in induced labor group with birth weight of <2.5 kgs compared to spontaneous labor group.

All of the following data has been depicted in table no 3.

Table 3: Modes of delivery in both the groups

		Type of labor				
		Induced		Spontaneous		p value
		N	%	N	%	
Mode of delivery	C- Section	31	28.44	2	1.83	<0.001*
	Forceps	2	1.83	2	1.83	
	Normal	62	56.88	88	80.73	
	Vacuum	14	12.84	17	15.6	
Baby weight category	<2.5	13	11.93	6	5.5	0.171
	2.5-2.99	54	49.54	64	58.72	
	≥3.0	42	38.53	39	35.78	

The association between mode of delivery and birth weight was assessed, were ported non -significant difference in distribution of patients. The frequencies and percentages of patients according to mode of delivery and birth weight categories is shown in table.

Table 4: Frequencies and percentages of patients according to mode of delivery and birth weight categories

Baby weight	Mode of delivery								p value
	C-Section		Forceps		Normal		Vacuum		
	N	%	N	%	N	%	N	%	
<2.5	3	9.09	0	0.00	16	48.48	0	0.00	0.218
2.5-2.99	16	48.48	2	6.06	83	251.52	17	51.52	
≥3.0	14	42.42	2	6.06	51	154.55	14	42.42	
Total	33	100.00	4	12.12	150	454.55	31	93.94	

DISCUSSION

The majority of women in their reproductive years are in good health, giving birth to healthy babies at term with spontaneous labour. In situations where the mother, foetus, or both need the pregnancy to end because continuing the pregnancy would be harmful to both the mother and the unborn child, inducing labour is one option. It is one of the most frequently performed obstetric procedures at the moment.[9]

According to reports, India's induction rate is 11.4 percent.[9]

The possibility that elective labour induction could increase the risk of a caesarean section is a major issue with labour induction (CS).[10]

The present study was carried out to study the rates of caesarean section, normal, and instrumental deliveries in women with induced labour as compared to those who go into spontaneous labour and to assess the need for augmentation. A total of 218 pregnant women were included in the present study. The mean age of the patients was 26.43 ± 4.04 years, ranging between 19 to 37 years. The mean gestational age was 38.61 ± 1.17 weeks, ranging from 37 to 41 weeks. The average weight of the

baby was 2.91-0.34kg, with a range of 2.2 to 3.83kg.

In the present study, among the 218 pregnant women included in the study, 113(51.83%) were primigravida and 105 were multigravida. There were an equal number of patients in the induction and spontaneous labour groups, with 109(50%) women in each group. Augmentation was required in 87(39.5%) of the 218 cases. Among those 87 deliveries, 46 were in the induced labour group and 41 in the spontaneous labour group.

Over all, there were 150(68.8%) normal deliveries, followed by 33(15.1%) caesarean sections, 31(14.2%) using vacuum and 4(1.8%) using forceps. Both the induced and spontaneous group populations were comparable by maternal age. While the gestation age in most of the cases in both groups was between 38 and 40 weeks.

Although induction is a method of treatment, it is also a medical intervention, and as such, it may have unfavourable outcomes such as an increase in the need for caesarean sections, post partum haemorrhage, foetal distress, prolonged labour that is in effective, an increase in instrumental deliveries, neonatal jaundice, and immediate baby care. [11,12]

In the present study, when compared between the spontaneous and induced labour groups, there were significantly more caesarean sections in the induced labour group compared to the spontaneous labour group. While the spontaneous group had a higher rate of normal deliveries than the induced group.

The induction group is linked to an increase in caesarean section rates of up to 31 percent when compared to the spontaneous group, which is 12 percent, according to research by Babu S et al.[9]

In the present study, there was no association reported between the baby's birth weight and the type of labor, although there was a greater number of babies in the induced labour group with a birth weight of <2.5 kg compared to the spontaneous labour group. Also, a non-significant difference in the distribution of patients according to mode of delivery and baby birth weight was noted.

Similar to the current study, Alalem, D. et al.[13] reported that there was no appreciable difference in complications, delivery method, blood transfusion, or instrument used between women who had spontaneous versus induced labour.

CONCLUSION

The present study was carried to study the rate of cesarean section, normal vaginal and instrumental deliveries in women with induced labor as compared to those who go in spontaneous labor and to assess need of augmentation. Overall, there were 150(68.8%) normal deliveries, followed by 33(15.1%) caesarean sections, 31(14.2%) using vacuum and 4(1.8%) using forceps. Both the induced and spontaneous group populations were comparable by maternal age.

There were significantly more cesarean sections in induced labor group compared to spontaneous labor group. While rate of normal deliveries was more in spontaneous group than induced. The distribution of forceps deliveries and vacuum deliveries were almost similar in both the groups.

Need of augmentation of labour was almost smilar in both the groups.

The non-significant association between mode of delivery and birth weight was reported in the study.

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REFERENCES

1. Anamika Singh, Smitha B. Rao, Bhavana Sherigar, Reena D'souza, Soumya R., Vismaya Kaveri. Comparison of progress of Labor and maternofetal outcome among induced versus spontaneous Labor in nulliparous women using modified WHO partograph. International Journal of Reproduction, Contraception, Obstetrics and Gynecology.(2018 Feb;7(2):415-418)
2. Mozurkewich EL, Chilimigras JL, Berman DR, Perni UC, Romero VC, King VJ, Keeton KL. Methods of induction of Labor: a systematic review. BMC Pregnancy Childbirth. 2011 Oct 27;11:84.
3. Caughey AB, Sundaram V, Kaimal AJ, Cheng YW, Gienger A, Little SE, Lee JF, Wong L, Shaffer BL, Tran SH. et al. Maternal and neonatal outcomes of elective induction of labor. [Review] [168 refs] Evidence Report/Technology Assessment. 2009;176:1–257.
4. Osaheni Lucky Lawani A, Iyoke CA, Okafo CN, Ajah LO. Obstetric Outcome and Significance of Labor Induction in a Health Resource Poor Setting. Hindawi Publishing Corporation Obstet Gynecol

Int. 2014;2014:5.

5. Battista L, Chung JH, Lagrew DC, et al. Complications of labor induction among multiparous women in a community-based hospital system. Am J Obstet Gynecol. 2007;197:7.
6. Hedegaard M, et al. Reduction in stillbirths at term after new birth induction paradigm: results of a national intervention. Br Med J. 2014;10(1136):4.
7. Kolkman DG, Verhoeven CJ, Brinkhorst SJ, van der Post JA, Pajkrt E, Opmeer BC, Mol BW. The Bishop score as a predictor of labor induction success: a systematic review. Am J Perinatol. 2013 Sep;30(8):625-30.
8. Marconi AM. Recent advances in the induction of labor. F1000Res. 2019 Oct 30;8:F1000 Faculty Rev-1829.
9. Babu S, Manjeera ML. Elective induction versus spontaneous labor at term: prospective study of outcome and complications. Int J Reprod Contracept Obstet Gynecol 2017;6:4899- 907.
10. Lee HR, Kim MN, You JY, Choi SJ, Oh SY, Roh CR, Kim JH. Risk of cesarean section after induced versus spontaneous labor at term gestation. Obstet Gynecol Sci. 2015 Sep;58(5):346-52.
11. Vardo JH, Thornburg LL, Glantz JC. Maternal and neonatal morbidity among nulliparous women undergoing elective induction of labor. J Reprod Med 2011; 56: 25-30.
12. Vrouenrates FP, Roumen FJ Dehing CJ, Vanden Akker ES, Aarts MJ, Scheve EJ. Bishop score and risk of cesarean delivery after induction of labor in nulliparous women. Obstet Gynecol 2005; 105(4): 690-700.
13. Alalem, D. ,Kafy, S. , Hashim, H. , Aldukkan, L. and Bajahmom, H. (2019) Spontaneous versus Induced Labor Delivery, a Retrospective Analysis. Advances in Reproductive Sciences, 7, 1-6. doi: 10.4236/arsci.2019.71001.