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A COMPARATIVE STUDY OF PREINDUCTION CERVICAL LENGTH MEASURED BY TRANSVAGINAL ULTRASOUND AND MODIFIED BISHOP'S SCORE IN PREDICTING NORMAL VAGINAL DELIVERY

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ABSTRACT

The present study was conducted to compare the efficacy of Transvaginal Cervical length and Modified Bishop's score in the prediction of normal vaginal delivery following PGE 2 gel induction.100 primigravida patients with term gestation were included in this study conducted at Govt RSRM Lying In Hospital. The results were tabulated and analysed. It was found that TVS cervical length in the range of 1-3 cm was a better predictor of normal vaginal delivery than Modified Bishop's score.

KEYWORDS | Induction, Labour, Bishop's score, Cervical length

INTRODUCTION

Induction of labour is defined as the process of artificial initiation of uterine contractions, any time after attainment of fetal viability, by a method that aims to secure vaginal delivery. Induction is carried out when the clinical course and outcome of pregnancy would be better if the pregnancy is terminated. Induction of labour is indicated when the risks of continuing the pregnancy for the mother or the fetus or both outweigh the potential benefits.

The more common indications include post term pregnancy, membrane rupture without labour, gestational hypertension, oligohydramnios, nonreassuringfetal status and various maternal medical conditions such as chronic hypertension and diabetes (American College of Obstetricians and Gynecologists, 2013b). Before induction one must ensure that the gestational age and fetal lung maturity is confirmed.

Induction of labour is one of the most common interventions practiced in modern world. Overall throughout the world, up to 20 per cent of women have labour induced by one method or the other.

Induction rates vary with practices and cultural backgrounds. The availability of newer oxytocics and induction techniques which are safer, more effective and predictable than the older techniques has made the process of induction more easier.

The favourability of the cervix before induction, is usually assessed by the Modified Bishop's Scoring System. If the cervix is unfavourable before induction cervical ripening agents may be used. Calculation of Bishop's score by digital examination is a subjective method to assess the cervical status to predict the success of labour induction and it has a high inter and intra observer variability. Transvaginal sonography is an objective method to assess the cervical length .The supravaginal portion of the cervix usually comprising about 50% of cervical length is very difficult to assess digitally. Hence the present study was carried out to study the Modified Bishop's Score and Cervical length before induction and to compare which is a better predictor of successful induction.

AIM OF THE STUDY

1. To measure the cervical length by Transvaginal USG and to assess the Modified Bishop's Score in patients undergoing elective induction of labour at term gestation
2. To compare the efficacy of Preinduction cervical length and Modified Bishop's score in prediction of normal vaginal delivery following elective induction.

MATERIALS AND METHODS
STUDY DESIGN
DOUBLE BLINDED INTERVENTIONAL STUDY

METHODOLOGY
The study was conducted in Govt. RSRM Lying In Hospital, Chennai during the period of December 2015 to September 2016 after getting approval from the Institutional Ethical Committee.100 patients who underwent induction of labour for various reasons were selected for the study and examined.

- Patients undergoing elective induction of labour at term gestation are assessed for the preinduction cervical length by Trans vaginal ultrasonography by EXAMINER 1
- The probe is placed in the vagina approximately 3 cm proximal to the cervix and the distance between the internal os and external os is measured as the Preinduction Cervical length.
- Cervical assessment by Modified Bishop's score is done by

EXAMINER 2
- The patients undergo induction of labour with Dinoprostone Gel [PGE2 GEL] based on their Modified Bishop's Score
- Outcome of induction is studied and the efficacy of prediction of normal vaginal delivery is compared between the two measurements.

INCLUSION CRITERIA
- Nulliparous women less than 35 years of age with 37 to 42 weeks gestation admitted for induction of labour
- Singleton live Pregnancy
- Cephalic presentation
- Intact membranes with no vaginal bleeding

EXCLUSION CRITERIA
- Multiparous women
- Multiple pregnancy
- Non cephalic presentation
- Patients with >3 cm cervical dilatation
- Prelabour rupture of membranes
- Previous uterine or cervical surgeries
- Patients with medical complications like GDM,GHTN etc.

Women who fulfilled the above criteria were included in the study. Informed consent was obtained from the patient and family members. Adetailed history of the patient was obtained and general and obstetric examination was done. The gestational age of the patient was confirmed with her dates, first trimester ultrasound and a basic obstetric ultrasound was performed to

confirm the fetal growth parameters and amniotic fluid index. The patient underwent a TransvaginalSonography for cervical length assessment. The probe was placed in the vagina approximately 3 cm proximal to the cervix to avoid any cervical distortion of its position or shape and a sagittal view of the cervix, with the echogenic endocervical mucosa along the length of the canal, was obtained. The calipers were used to measure the distance between the internal os and external os, the furthest points at which the cervical walls were juxtaposed. Three measurements were obtained and the shortest, technically best measurement in the absence of uterine contractions was recorded.

Preinduction favourability of the cervix was assessed with the Modified Bishops Score and Induction was done with PGE2-DINOPROSTONE Gel 0.5 mg intracervical application. With the patient in a dorso lithotomy position, the cervix is exposed and held. The tip of the cannula, which is attached to the pre-filled syringe, is inserted gently to just below the internal os. The gel is then instilled into the cervix. The patient is kept in a reclining position for the next 30 minutes. The women had further vaginal examination after 6 hours and depending upon the Bishops score further doses of Dinoprostone gel were considered. The maximum recommended dosage is 1.5 mg (three doses) within a period of 24 hours. However in our institution the favourability was assessed after 1.0 mg of PGE 2 gel (2 doses) and the patient is taken up for Caesarean Section if the cervix was still unfavourable as Failed Induction. Oxytocin augmentation was started in cases of unsatisfactory progress of labour and after amniotomy.

The induction delivery interval, Caesarean section rates and indications, Birth weight and APGAR score of the babies were noted and tabulated. Statistical analysis was done and P value <0.05 was considered significant.

RESULTS AND ANALYSIS

Table 1: COMPARISON OF TVS CX LENGTH ,BISHOP'SSCORE AND MODE OF DELIVERY.

CHART 1

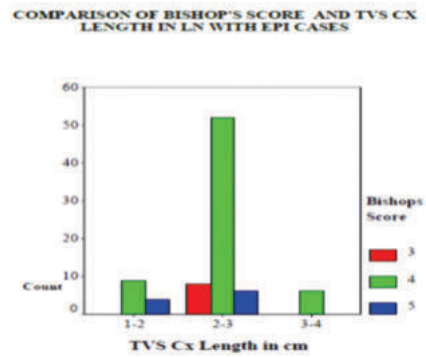COMPARISON OF BISHOP'S SCORE AND TVS CX LENGTH IN LN WITH EPI CASES

TABLE 2

COMPARISON OF BISHOP'S SCORE AND TVS CX LENGTH IN LN WITH EPI CASES

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bishops Score	4.02	85	.462	.050
	TVS Cx Length in cm	2.380	85	.4538	.0492

TABLE 3

COMPARISON OF BISHOP'S SCORE AND TVS CX LENGTH IN LN WITH EPI CASES

Paired Samples Test

CHART 2

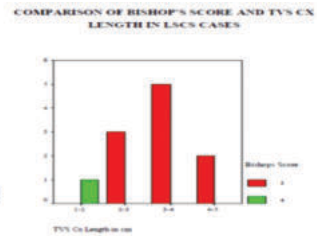COMPARISON OF BISHOP'S SCORE AND TVS CX LENGTH IN LSCS CASES

TABLE 4

COMPARISON OF BISHOP'S SCORE AND TVS CX LENGTH IN LSCS CASES

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bishops Score	3.09	11	.302	.091
	TVS Cx Length in cm	3.255	11	.7874	.2374

TABLE 5

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Bishops Score - TVS Cx Length in cm	-.164	.9909	.2988	-.829	.502	-.548	10	.596

DISCUSSION

100 primigravida patients were included in this study in the age

group of 18 to 35 years. The mean age of the study group being 23.49 years. The most common indication for induction was post datism. The other two indications were Oligohydramnios and Rh negative pregnancy. In a similar study by Pandis et al the indications for induction were prolonged pregnancy, gestational hypertension, diabetes mellitus, maternal cholestasis, pruritus, hypothyroidism, maternal renal disease, suspectedfetal growth restriction ,oligohydramnios, polyhydramnios etc.

The patients in the study group were induced from 37 to 42 weeks gestational age. About 77 patients were induced at the gestational age of40 weeks to 40 weeks 6 days interval. Many patients were induced one or two days after the completion of 40 weeks due to abnormalities in the Modified Biophysical Profile monitoring. If the NST and AFI monitoring is normal routine induction was done at 41 weeks. In the study conducted byPandis et al the mean gestational age at induction was 41 weeks The patients in the study group had a preinduction Bishop's score of 3,4or 5.72 patients had a preinduction Modified Bishops Score of 4.The median Modified Bishops Score was 4.In the study of Pandis et al the median Bishops score was 3.

The patients in the study group had cervical lengths in the range of 1 to 5 cm.73 patients had a cervical length between 2 to 3 cm. The mean TVS Cx length of the study group was 2.486cm. In the study conducted byPandis et al the median TVS length was 2.5 cm.

In our study 90 patients received a single dose of PGE 2 gel and 10 Patients received 2 doses of PGE 2 gel. Of these 10 patients, 4 delivered vaginally and 6 delivered by LSCS for failed induction.

On analyzing the mode of delivery in our study 85 patients had normal vaginal delivery and 11 patients underwent LSCS.4 patients delivered with Outlet forceps. 4 cases of LSCS were done for fetal distress and 7 cases for failed induction.

In this study the mean birth weight of the babies born was found to be 2.944 kg. About 58 babies were in the range of 2.5 to 3.0 kg.

The average induction to delivery interval in our study group was 9 hours 52 minutes.

93.1 % of patients with a Bishops score of 4 delivered vaginally and 1.4% had LSCS. Only 44.4 % of patients with a Bishops Score of 3 delivered vaginally.100 % of patients with a Bishops score of 5 delivered vaginally. Bishops score appears to reliably predict vaginal delivery only at values of 4 and above .For patients with a Bishops score of 3 and less than that it was difficult to predict normal vaginal delivery.

The study of Kanwar et al showed that 73.25 % cases with Bishop's score > 6 delivered vaginally and 26.74% underwent LSCS. On the other hand cases with Bishop's score of < 6 had to undergo LSCS and only 20.83 % delivered vaginally 92.9 % of patients with a cervical length of 1 to 2 cm delivered vaginally and 7.1% underwent LSCS. 90.4 % of patients with a TVS cervical length of 2 to 3 cm delivered vaginally and 4.1% underwent LSCS.. Only 54.5% of patients with TVS Cx length of 3 to 4 cm delivered vaginally and 45.5% underwent LSCS. Only two patients had a cervical length of more than 4 cm and both ended up in LSCS for Failed Induction. TVS cervical length in the range of 1 – 3 cm appears to predict vaginal delivery more reliably and it is a better predictor of success of induction.

According to the study of Kanwar et al, vaginally delivered cases were more compared to LSCS when cervical length was < 3.5 cm with 86.67% and 13.33% respectively. When the cervical length was >3.5 cm LSCS cases were more with 91.42% and 8.57% respectively.

SUMMARY
The present study was done at Govt RSRM Lying In hospital study the Modified Bishop's score and the Transvaginal cervical length of patients before PGE2 gel induction and compare the efficacy of

each as a predictor of successful induction which denotes normal vaginal delivery.

100 primigravida patients were included in this study in the age group of 18 to 35 years.The mean age of the study group being 23.49 years.The most common indication for induction was post datism.The other two indications were Oligohydramnios and Rh negative pregnancy.About 77 patients were induced at the gestational age of 40 week to 40 weeks 6 days interval.72 patients had a preinduction Modified Bishops Score of 4 .The median Modified Bishops Score was 4.

73 patients had a cervical length between 2 to 3 cm.The mean TVS Cx length of the study group was 2.486cm.

90 patients received a single dose of PGE 2 gel and 10 Patients received 2 doses of PGE 2 gel. Of these 10 patients, 4 delivered vaginally and 6 delivered by LSCS for failed induction.

On analyzing the mode of delivery in our study 85 patients had normal vaginal delivery and 11 patients underwent LSCS.4 patients delivered with Outlet forceps..4 cases of LSCS were done for fetal distress and 7 cases for failed induction.

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92.9 % of patients with a cervical length of 1 to 2 cm delivered vaginally and 7.1% underwent LSCS. 90.4 % of patients with a TVS cervical length of 2 to 3 cm delivered vaginally and 4.1% underwent LSCS..Only 54.5% of patients with TVS Cx length of 3 to 4 cm delivered vaginally and 45.5% underwent LSCS. Only two patients had a cervical length of more than 4 cm and both ended up in LSCS for Failed Induction.

TVS cervical length in the range of 1 – 3 cm appears to predict vaginal delivery more reliably and it is a better predictor of success of induction.

CONCLUSION
Induction of labour is one of the most common obstetric practices carried out in the world. Compared to spontaneous onset of labour, induction of labour is complicated by a higher rate of Caesarean section.

This difference is greater for nulliparous women with unfavourable cervix. To assess the preinduction favourability of the cervix Transvaginal Sonography appears to be better tool than traditional Modified Bishop's score. TVS cervical length measurement is easy to learn, more reproducible and with images that can be documented for intra and inter observer comparison. Initial changes at the internal os of the cervix can be observed by TVS even with a closed external os.

So this study was conducted with 100 patients who underwent induction of labour at 37 to 42 weeks in our hospital. The most common indication for induction was prolonged pregnancy.PGE2 gel induction was done and the results were tabulated and analysed. Transvaginal cervical length in the range of 1 to 3 cm was found to be a better predictor of normal vaginal delivery than Modified Bishop's Score. This is a objective, more reproducible and quantitative method which can be performed easily in the setting where the appropriate equipment and expertise is available.

Therefore more liberal use of ultrasonography for preinduction cervical assessment in term pregnancy would enable obstetricians to predict the outcome of labour induction and to select a safe and more efficient policy of induction

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