



AN OBSERVATIONAL STUDY OF PREINDUCTION TRANSVAGINAL SONOGRAPHIC ASSESSMENT OF CERVICAL LENGTH FOR SINGLETON FULL TERM PREGNANCY IN PREDICTING SUCCESS OF LABOR INDUCTION AT TERTIARY CARE CENTER AT SOUTH GUJARAT.

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ABSTRACT

Background: Induction of labor is a process where uterine contractions are initiated by medical or surgical means before the spontaneous onset of labor and is carried out in approximately 20% of pregnancies. The commonest indication for induction is prolonged pregnancy, and several studies have shown that induction, compared to expectant management, is associated with a substantial reduction in perinatal morbidity & mortality. **Method:** This prospective observational study was done in New Civil Hospital Surat for 1-year period. 200 Preinduction consenting women admitted to Labor room of New Civil Hospital Surat were enrolled in this study group. **Results:** In our study Majority of the subjects (49%) belonged to age group of 21-25 years, Majority (58%) of subjects were multigravidas. Majority of inductions were done for PROM (45%) followed by post-datism (23%). Out of total 200 subjects who were induced 170 subjects delivered vaginally and 30 subjects undergone C-section due to various reasons. Out of 200 subjects, 23 subjects had cervical length 2 cm out of which all patients delivered vaginally, 60 subjects had cervical length between 2.1-2.5 cm out of which 51 delivered vaginally and 9 subjects underwent LSCS, 117 subjects had cervical length > 2.6 cm out of which 96 delivered vaginally and 21 underwent LSCS. There was significant association between cervical length and Mode of delivery. Out of 170 patients delivered vaginally 152 subjects were delivered within 24 hours of induction. 88% Subjects delivered within 24 hours only 12% subjects were undelivered in 24 hours. **Conclusion:** Transvaginal cervical length provides a better prediction of the likelihood of vaginal delivery within 24hrs of induction. TVS cervical length could be used as a better alternative to Bishop Score for successful labor induction in the setting where the appropriate equipment and expertise are available.

KEYWORDS : Transvaginal cervical length, Induction of labor, vaginal delivery.

INTRODUCTION

Induction of labor is a process where uterine contractions are initiated by medical or surgical means before the spontaneous onset of labor. Data from the National Centre for Health Statistics for the last decade indicate that the rate of labor induction has increased gradually from 9% to 20%. [1]. Induction of labor is one of the common interventions in obstetric practice. Cervical assessment has been used as a prediction of the successful vaginal delivery. Bishop originally observed that nulliparous women undergoing induction of labour with a cervical score >8 had the same likelihood of vaginal delivery as did women in spontaneous labor. Labor induction with a low cervical score has been associated with failure of induction, prolonged labor, and a high rate of caesarean deliveries. The commonest indication for induction is prolonged pregnancy [2]. Several studies have shown that induction, compared to expectant management, is associated with a substantial reduction in perinatal morbidity & mortality. This study is designed to investigate transvaginal ultrasonographic cervical measurement as a predictor of duration of labor and successful induction resulting in vaginal delivery.

MATERIALS AND METHODOLOGY

This prospective observational study was done at Labor room of New Civil Hospital Surat for 1-year period after official approval from Ethical Committee.

200 Preinduction consenting women admitted to labor room of Obstetrics department of New Civil Hospital Surat were enrolled in this study.

Cervical length measured from external os to internal os by TVS after emptying the bladder.

Three measurements were taken and average of that was recorded. All measurements were taken by a single observer to avoid Error. All data related to clinical profile, maternal and fetal outcome collected from case record of mother in a structured Performa. USG done by MINDRAY machine which is available has transvaginal probe frequency of 7 Hz.

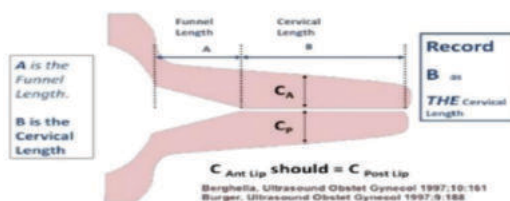
Measurement of the Cervix

Fig 1: Measurement of cervical length by TVS scan

Inclusion Criteria:

- All Primigravida and Multigravida with Full Term Pregnancy (After 37-41 weeks)
- Singleton pregnancy
- Post maturity & Post term pregnancy
- Premature rupture of membrane
- Oligo-hydramnios, IUGR, Rh isoimmunization.
- Induction done for medical conditions with pregnancy like Hypertensive disorder of pregnancy, Diabetes, Sickle cell disease, Chronic Pulmonary Disease, Intrauterine death.

Exclusion Criteria:

- Malpresentation (breech, transverse, oblique lie)
- Cephalopelvic disproportion
- Multiple pregnancy, congenital malformations of uterus, previous cervical surgeries.
- Non consenting women.

RESULTS

Table: 1 – Distribution Of Subjects According To Baseline Variable.

DISTRIBUTION OF SUBJECTS BASELINE VARIABLE		
AGE IN YEARS (N=200)		
15 – 20	66	33 %
21 – 25	98	49 %
26 – 30	34	17 %
31 – 35	2	1 %
INDICATION FOR INDUCTION (N=200)		
POST DATISM	46	23 %
PROM	90	45 %
HYPERTENSIVE DISORDERS OF PREGNANCY	36	18 %
PROLONGED LATENT PHASE	4	2 %
OLIGOHYDRAMNIOS	14	7 %
RH ISOIMMUNIZATION	4	2 %
GESTATIONAL DIABETES MELLITUS	2	1 %
INTRAUTERINE GROWTH RESTRICTION	4	2 %

Among the study participants, 98(49%) were belonged to 21-25 years of age group followed by 66(33%) were belonged to 15-20 years of age. Only 2 participants were from 31-35 years of age group in the study. Out of total, 45% of patients had indication for induction of labor due to PROM followed by 23% due to post-datism, 18% due to hypertensive disorders of pregnancy and 7 % due to oligohydramnios. Only 2% cases had indication for induction of labor due to prolonged latent phase, 2 % due to IUGR, 2% due to Rh isoimmunization and 1% due to GDM.

Table-2: Distribution Of Subjects According Cervical Length

DISTRIBUTION OF SUBJECTS ACCORDING CERVICAL LENGTH			
MODE OF DELIVERY			
CERVICAL LENGTH	VAGINAL DELIVERY (n=170)	LSCS (n=30)	TOTAL (n=200)
2 CM	23	00	23
2.1 CM – 2.5 CM	51	09	60
> 2.6 CM	96	21	117
PARITY			
CERVICAL LENGTH	PRIMI (n=84)	MULTI(N=116)	TOTAL (N=200)
< 2 CM	13	10	23
2.1 – 2.5 CM	30	30	60
> 2.6 CM	41	66	117

Out of 200 subjects,23 subjects had cervical length 2 cm out of which all patients delivered vaginally, 60 subjects had cervical length between 2.1-2.5 cm out of which 51 delivered vaginally and 9 subjects underwent LSCS, 117 subjects had cervical length >2.6 cm out of which 96 delivered vaginally and 21 underwent LSCS. In our study, total 23 participants had cervical length 2 cm out of which 13 were primigravida and 10 were multigravida. Out of 60 participants who had cervical length between 2.1-2.5 cm, 30 were primigravida and 30 were multigravidas.117 participants had cervical length >2.6 cm out of which 41 were primigravida and 66 were multigravidas.

Table-3: Association Of Bishop Score To Mode Of Delivery.

PARAMETERS	VAGINAL DELIVERY (n=170)	LSCS (n=30)	TOTAL (n=200)
BISHOP SCORE			

1 – 3	40	16	56
4 – 6	130	14	144
>6-13	00	00	00

In our study, out of 200 subjects ,56 had bishop score between 1-3 out of which 40 patients delivered vaginally and 16 patients underwent LSCS and 144 had Bishop score between 4-6 out of which 130 delivered vaginally and 14 patients underwent LSCS.

Table: 4 - Distribution Of Subjects According To Induction To Delivery Interval.

DISTRIBUTION OF SUBJECTS ACCORDING TO INDUCTION TO DELIVERY INTERVAL.		
INDUCTION TO DELIVERY INTERVAL (N=170)		
<24 HRS	152	88 %
>24 HRS	18	12 %

Out of 170 patients delivered vaginally 152 subjects were delivered within 24 hours of induction.88% Subjects delivered within 24 hours only 12% subjects were undelivered in 24 hours.

Table-5: Distributions Of Subjects According To Number Of Time Induction Done.

NO. OF TIME INDUCTION	NUMBER	MECHANICAL + PGF2α gel	PGF2α gel only
1	70	YES	
2	72	YES	1 TIME
3	28	YES	2 TIME

In our study, out of total 170 subjects delivered vaginally 70 subjects delivered after 1 induction with mechanical method + PGF2α gel. 72 subjects delivered after 2 times induction done with mechanical + PGF2α gel followed by PGF2α gel only. 28 subjects delivered after 3 times induction done with mechanical + PGF2α gel followed by PGF2α gel only with 2 times.

Table 6: Distribution Of Subjects According To Indication Of Lscs

INDICATION OF LSCS (N=30)		
FETAL DISTRESS	10	33.3
NON-PROGRESS OF LABOUR	4	13.3
FAILED INDUCTION	12	40
MSL	4	13.3

Out of total 30 subjects with LSCS mode of delivery 10 were due to fetal distress followed by 4 due to NPOL, 12 due to Failed Induction and 4 due to MSL.

Table 7: Association Between Cervical Length And Mode Of Delivery

CERVICAL LENGTH	NORMAL DELIVERY(N=170)	LSCS (N=30)	P-VALUE
2-2.6 cm	88	09	0.029
>2.6 cm	82	21	

There was significant association between cervical length and Mode of delivery. As cervical length decreases that is more chances of vaginal delivery.

Table 8: Comparison Of Mean Cervical Length

Studies	Mean Cervical length (in Cm)
Present study	2.7
Roshan et al	2.4
Elghorori et al	3.4
Shreya et al	2
Panchampreet et al	2.8
Ranjana et al	2.7
Pandis et al	2.4

Recent randomized study comparing use of transvaginal

sonographic assessment and Bishop Score to guide preinduction cervical ripening with prostaglandins has shown a reduction in prostaglandin use without affecting successful labour induction with trans vaginal ultrasonography.

Table 9: Comparison Of The Primary Outcome Measures With Other Study

OUTCOME MEASURES	PANDIS ET AL (Total No.240) No. (%)	THIS STUDY (Total No. 200) No. (%)
Number of vaginal delivery	194 (80.4%)	170 (85%)
Number of LSCS	46 (19.2%)	30 (15%)
Number delivered within 24hrs	142 (73.2%)	152(74%)

There was significant association between Dilatation, Station, Position and Mode of delivery. No association was found between Effacement, cervical consistency and Mode of delivery.

Table 10: Association Between Various Variable Of Bishop Score And Mode Of Delivery:

Variable		Normal delivery	LSCS	p-value
Dilatation	Closed	46	2	0.024
	1-2 cm	123	27	
	3-4 cm	1	1	
Effacement	0-20%	84	20	0.154
	21-50%	83	9	
	51-80%	3	1	
Station	-3	83	21	0.0067
	-2	85	7	
	-1	2	2	
Cervical Consistency	Firm	1	1	0.163
	Soft	169	29	
Position	Posterior	78	4	0.0027
	Mid position	88	24	
	Anterior	4	2	

DISCUSSION

The study has demonstrated that induction to delivery interval is significantly associated with both the preinduction bishop score and the sono-graphically measured cervical length. Higher the Bishop score and lesser the cervical length better the likelihood of vaginal delivery. TVS cervical length was a better predictor of successful labour induction in terms of delivery within 24 hrs of induction. Both sonographic cervical assessment and the Bishop Score successfully predicted vaginal delivery within 24 hrs. As the cervical length increases the likelihood of delivering within 24hrs decreases whilst, as bishop score increase, the likelihood of delivering within 24hrs increases. In present study, total 98(49%) patients belonged to 21-25 years of age group followed by 66(33%) belonging to 15-20 years of age. Only 2 participants were from 31-35 years of age group in the study. In this research, 45% of patients had indication for induction of labor due to PROM followed by 23% due to post datism and 7 % due to oligohydramnios. Only 2% cases had indication for induction of labor due to prolonged latent phase, 2 % due to IUGR, 2% due to Rh isoimmunization and 1% due to GDM. In this research, 45% of patients had indication for induction of labor due to PROM followed by 23% due to post datism and 7 % due to oligohydramnios. Only 2% cases had indication for induction of labor due to prolonged latent phase, 2 % due to IUGR, 2% due to Rh isoimmunization and 1% due to GDM. Of total, in 85% and 15% cases had Vaginal and Caesarean Section mode of delivery respectively. Among the study participants, 48 patients had closed Dilatation, while only 2 patients had 3-4 cm of dilatation. In the study, 52% cases had 0-20% of effacement followed by 46% with 30- 50% of effacement. In the study, only 2(1%) cases had soft cervical consistency. Among the study participants, 82 had posterior position, 112 had Mid position

and 6 cases had anterior position. Out of total 30 subjects with LSCS mode of delivery 10 were due to fetal distress followed by 4 due to NPOL and 12 due to failed induction and 4 due to MSL. Mean induction to delivery interval was 12.7 hours. In the setting where Transvaginal sonographic measurement of cervical length can be achieved easily, correctly and with minimal discomfort to the patient, it provides a useful prediction of the likelihood of vaginal delivery within 24 hrs of induction and of the induction to delivery interval. It helps in counselling the women regarding the outcome of labour induction. Women with a cervical length of less than 2.6 cm can be counselled that delivery will possibly occur within 24 hrs of induction, whereas those with cervical length of 3cm can be advised that they have an approximately 67% chance of remaining undelivered after this interval. Bishop score still remains a useful test in the setting where the equipment and experts are not available as it is a simple, inexpensive test and does not require technical expert.

CONCLUSION

Sonographic measurement of cervical length is a quantitative and an objective method with minimum interobserver variation. However, those undertaking this measurement should receive appropriate training. Digital examination of the cervix does not involve extra cost, any extra equipment or any additional training. Bishop score remains the most cost effective and simple method of predicting the outcome of the induction of labour. As cervical length decreases and bishop score increases there is more chance of vaginal delivery. Bishop score and transvaginal cervical length both are good predictors of successful induction of labour. Transvaginal cervical length provides a better prediction of the likelihood of vaginal delivery within 24hrs of induction. TVS cervical length could be used as a better alternative to Bishop Score for successful labour induction in the setting where the appropriate equipment and expertise are available. But definitely Transvaginal sonography is an objective method for preinduction cervical length assessment and should be used as an adjunct to Bishop Score wherever possible and indicated.

Acknowledgments

Authors would like to acknowledge obstetrics and gynecology department staff, all participants for their support during study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee.

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