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ORIGINAL ARTICLE

TO COMPARE TRANSVAGINAL CERVICAL LENGTH MEASUREMENT WITH MODIFIED BISHOP'S SCORE IN PREDICTING SUCCESS OF LABOUR INDUCTION (IN TERMS OF VAGINAL DELIVERY WITHIN 24 HRS).

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ABSTRACT

Objective: This study is to compare and assess the effectivity of Transvaginal ultrasonography and the Modified Bishop's Scoring System in predicting success of labour induction in terms of delivery within 24hrs. **Methods:** A prospective study was performed on One hundred and twenty five nulliparous women admitted for induction of labour. The cervical length was measured by TVS in cm followed by Digital vaginal examination done to record the modified Bishop's score. Dinoprostone gel (0.5mg) was kept in the endocervical canal for inducing labour. Successful induction is vaginal delivery within 24 hrs from induction of labour. **Results:** TVS Cervical length is the better predictor of the likelihood of delivering vaginally within 24hrs than the modified Bishop's Score, with a sensitivity of 71.4% and a specificity of 100% compared to 75% and 66.6% respectively. **Conclusion** : Transvaginal sonographic measurement of cervical length is a better predictior of the likelihood of vaginal delivery within 24hrs of induction when compared to modified Bishop's Score.

Keywords: Induction of labour, Transvaginal sonography, Modified Bishop's Score.

1.INTRODUCTION

Induction of labour is an intervention to artificially initiate uterine contractions leading to progressive dilatation and effacement of cervix and birth of baby.

Effacement is thinning out, like disappearing of cervix, where os externum is at the same place as os internum. Dilatation is opening of os externum cervicis from diameter 1 cm to 10 cm.

Induction is performed in about 20% of pregnancies and postdatism is the leading indication for induction. The goal of induction is to prevent postdated pregnancy with its associated increased perinatal morbidity, mortality and operative delivery rates. Successful induction depends on cervical assessment or ripeness. Ripeness is defined as decrease in collagen concentration and increase in elastin/ collagen ratio resulting in softening of the rigid structure of cervix .

The goal of labour induction is to achieve a successful vaginal delivery and reduce caesarean section.

Methods for predicting pre induction favourability of cervix are: -

Bishop's Score a subjective method to assess cervical status to predict outcome of labour. But it has a high inter and intra observer variability. The Bishop's Score was developed in 1964 as a predictor of success of an elective induction.

The initial scoring system used 5 determinants:

- Dilatation
- Effacement
- Station
- Position
- Consistency

Each contributing a value of 0 to 2 or 3 points each (for a maximum score of 13).

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In 1966, Burnett modified the scoring system (known as MBS) so that each valuable was assigned a maximum value of 2 points (for a maximum score of 12). A favourable pre-induction Bishop's Score of >6 is predictive of a successful vaginal delivery. Of the Bishop's Score criteria for predicting successful induction, the most important is, cervical dilatation, followed by length, station, position, with the least important being consistency(Crane,2006).

Transvaginal ultrasonography has been known as an objective method to assess cervical length, because the supravaginal portion of cervix, usually comprising about 50% of cervical length, is very difficult to assess digitally. The assessment of effacement which starts at the internal os will be difficult to predict in a closed cervix. In contrast, sonographic measurement of cervical length is quantitative(Pandis et al., 2001). The present study has been done to determine if Transvaginal Ultrasound, with its ability to objectively measure the ervical length, could predict the outcome of induction better than clinical assessment obtained by the Modified Bishop's Score(Bishop,1964).

2.MATERIAL AND METHODS

In accordance with the ethical principles and with the approval by the institutional ethical review board, this randomized prospective comparative study was conducted in the department of Obstetrics and Gynaecology at Rajah Muthiah Medical College and Hospital from December 2014 till August 2016 for a period of about 2 years. One hundred and twenty five (125) nulliparous women were admitted to the hospital for induction of labour after getting informed consent. Women with intrauterine fetal death or previous scarred uterus were excluded from the study.A detailed history was taken and general,abdominal and pelvic examinations was done.Obstetrical examination was done to assess the lie of the fetus and engagement of head followed by digital vaginal examination to assess the cervix for consistency,effacement,dilatation,position and station of the presenting part. Bishop's Score is noted in the proforma. Transvaginal ultrasound examination was done after asking the patient to empty the bladder.Once the cervical canal is identified,the probe is withdrawn slightly so that there is no pressure exerted on the cervix by the tip of the probe. The saggital image of the entire cervical canal was acquired sonographically. The saggital plane through the cervix is identified where the external cervical os,the cervical canal and the internal cervical os were visible.The cervical images were acquired three times in succession and the mean cervical length was noted in the proforma.

The method of induction of labour was decided after the initial vaginal examination. There was universal electronic fetal monitoring for women undergoing labour induction. The agent used for induction of labour was Dinoprostone (0.5mg) gel placed in the endocervical canal. The patient is reassessed after six hours depending on the cervical dilatation and presence of uterine contractions,another dose of Dinoprostone (0.5 mg) gel might be inserted. Maximum of three doses can be repeated and amniotomy was usually performed when the cervix was ≥3cm dilated,and the presenting part was low (≥'0'station).

After delivery, analysis was done with the recorded data to compare the cervical length measured by TVS with modified Bishop's score for cervical assessment before induction of labour.

3.RESULTS

One hundred and twenty five (125) nulliparous women with gestational age between 37 to 42 weeks admitted in Rajah Muthiah Medical College and Hospital from December 2014 till August 2016 for induction of labour were taken in the present study. Maximum patient in the study belong to 21-25 years of age group (49.6%). The Mean gestational age by LMP was 277days and mean gestational age by USG was 274days.

The indications of labour induction were; post-term 49 patients(39.2%),PIH19patients(15.2%),prolongedlatentphase21patients(16.8%),decreasedAFI<8cm21patients(16.8%),decreased fetal movements 15 patients (12%). Out of 125 patients,73(58.4%) had caesarean section and 52 patients (41.6%) delivered vaginally. Out of 73 patients delivered by caesarean section,13 (17.8%) were done for fetal distress and 60 (82.2%) were due to non progression of labour.

Demographic variables (age distribution, gestational age & indication for induction) are summarized.

Table 1: **Age Distribution:**

AGE	No. of Patients	Percentage
15-20 yrs	12	9.6%
21-25 yrs	62	49.6%
26-30 yrs	44	35.2%
31-35 yrs	7	5.6%
Total	125	100%

Table 2: Distribution of Gestational age:

STUDY PARAMETER	GESTATIONAL AGE IN DAYS MEAN ± SD
GESTATIONAL AGE BY LMP	277.70±6.672(255-290)
GESTATIONAL AGE BY USG	274.39±6.517(259-287)

TABLE 3: Indication for Induction:

Indication for Induction	No. of Patients(%)
Post Datism	49 (39.2%)
PIH	19 (15.2%)
Prolonged latent phase	21 (16.8%)
Decreased A F I <8cm	21 (16.8%)
Decreased fetal movements	15 (12%)

TABLE 4: bishop score total

BISHOP SCORE	No. of Patients(%)
1	4 (3.2%)
2	17 (13.6%)
3	45 (36%)
4	5 (4%)
5	28 (22.4%)
6	26 (20.8%)

Table 5: transvaginal cervical length

TVS Cervical Length	No. of Patients
<2 cm	12 (9.6%)
2.1- 2.5 cm	22 (17.6%)
≥2.6 cm	91 (72.8%)

Women with transvaginal cervical length <2cm were 9.6%,17.6% women were with cervical length between 2.1-2.5cm and 72.8% were with cervical length ≥ 2.6cm.

Table 6: Mode Of Delivery

MODE OF DELIVERY	No. of Patients(%)
Vaginal	52 (41.6%)
Caesarean	73 (58.4%)

Vaginal delivery occurred in 41.6% of women and in 86.5% of these, delivery was within 24hrs of induction. There were 58% deliveries by caesarean section.

Table 7: Indication For Lscs

INDICATION	No. of Patients(%)
Non progression of labour	60 (82.2%)
Fetal distress	13 (17.8%)

Out of 125 patients, 52 delivered vaginally, and 73 underwent LSCS. Out of 73 patients, 13 were done for fetal distress & 60 were due to non progression of labour.

Table 8: Fetal Outcome

VARIABLE	Mean±SD
Birth weight	2.80±0.403(2-4.2kg)
APGAR@One minute	5.77±1.09(3-8)
APGAR @Five minute	7.76±0.817(5-9)

Table 9: Nicu Admission

NICU admission	No. of Patients
Yes	35(28%)
No	90(72%)

28% 0f neonates required NICU admission.

Table 10:Primary Outcome Measures

OUTCOMEMEASURES	No. of Patients(%)
Number of patients with Induction to Delivery interval <24hrs	45(36%)
Number of patients with Induction to active phase interval < 12hrs	46(36.8%)
Number of vaginal deliveries <48hrs	52(41.6%)

Table 11:Mean TVS cervical length&Modified Bishop's score

VARIABLE	Mean±SD
Cervical length (TVS)	2.96±0.59
Bishop's score	3.91±1.50

Table 12: Comparison of predictive values between Bishop's score and TVS cervical length

VARIABLE	SENSITIVITY	SPECIFICITY	PPV	NPV	PREDICTIVE VALUE
BISHOP SCORE≥4	75%	66.6%	97.3%	14.2 %	>0.05
TVS CERVICAL LENGTH≤2.6Cm	71.4%	100%	100%	15%	<0.001

Though Bishop score has more sensitivity than TVS cervical length , specificity and positive predictive value of the transvaginal cervical length is 100%. Significant predictive value is obtained for cervical length <0.001.So, transvaginal cervical length is found to be a better predictor of successful induction of labour in terms of delivery within 24 hrs when compared to modified Bishop's score.

Table 13:Comparison of number of women undelivered at 24 hrs:

VARIABLE	No of deliveries within 24hrs	No. Undelivered at 24hrs
BISHOP'S SCORE≥4	37 (97.3%)	1 (2.7%)
TVS CERVICAL LENGTH≤2.6cm	35 (100%)	0 (0%)

Further comparing the prediction of women who remained undelivered at 24hrs, it is found that 2.7% of women with Bishop Score ≥4 remained undelivered when compared to none with a TVS cervical length of ≤2.6cm This points towards TVS cervical length being a better predictive of successful labour induction compared to modifiied Bishop's Score in terms of delivery within 24hrs.

4.DISCUSSION:

Induction of labour has become increasingly common in modern obstetric practice.Being able to predict the outcome of induction in women with unfavourable cervix is important in planning management(RCOG,2001). Labour induction with a low cervical score has been associated with failure of induction,prolonged labour and high rate of caesarean deliveries. Traditionally,the assessment of cervix has been done by the Bishop's score and it is the most commonly used method to determine the outcome of labour induction.

Transvaginal ultrasonography is commonly used to predict preterm deliveries,and in recent years,it has also been used to predict the outcome of la cervical labour induction with varying success.

In this study, cervical assessment by transvaginal ultrasonography, particularly the measurement of cervical length, showed a significant predictability for successful labour induction in terms of vaginal delivery within 24hrs.

Digital examination has limitation in assessing the change of the internal os when the external os is closed. The ability of ultrasonography to visualize the internal os can help differentiate the patients with different outcomes in labour induction.

This study was designed to investigate transvaginal ultrasonographic cervical measurement as a predictor of duration of labour and successful induction resulting in vaginal delivery within 24hrs .

The study has also demonstrated that induction to delivery interval is significantly associated with both the preinduction modified bishop's score and the sonographically measured cervical length, higher the modified Bishop's score and lesser the TVS cervical length better the likelihood of vaginal delivery(Cook and Papageorghiou,1995). TVS cervical length was a better predictor of successful labour induction in terms of delivery within 24 hrs of induction.

In this study, though the sensitivity of the modified Bishop's Score in predicting the successful labour induction is higher (75%) compared with that of TVS cervical length(68%)(Crane,2006). The specificity and positive predictive value for the TVS cervical length was100 % compared with the modified Bishop's Score(66.6% and 97.3% are respectively).

5.CONCLUSION:

Transvaginal cervical length provides a better prediction of the likelihood of vaginal delivery within 24hrs of induction. TVS cervical length is a objective method and modified Bishop's score is a subjective method so, subjective variations may occur in modified Bishop's score by different observers but not in TVS cervical length(Langhon et al., 2011).

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