INDUCTION OF LABOUR;
ACCURACY OF TRANSVAGINAL ULTRASONOGRAPHY AND BISHOP SCORE IN PREDICTION OF SUCCESSFUL INDUCTION OF LABOUR AT TERM.

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Article received on:
06/06/2018
Accepted for publication:
25/12/2018
Received after proof reading:
23/02/2019

ABSTRACT… Background: Increased risk for the baby and higher perinatal mortality are related to birth after 42 weeks. To find out whether a delivery occurs within a span of 24 hours, assessment of cervix through Transvaginal ultrasonography (TVS) and Bishop's Score are two methods. **Objectives:** To find out the accuracy of transvaginal ultrasound and Bishop's Score for cervical length assessment to know the success of induction of labor in primigravidas at term. **Setting:** Department of Obs and Gynae of Civil Hospital, Bahawalpur. **Study Design:** Cross sectional study. **Period:** Nov 1st 2016 to April 30th 2017. **Material and Methods:** Total 220 females were included through non probability, purposive sampling. Females underwent vaginal examination and Bishop Score was noted and case was labeled as positive or negative. TVS and cervical length was measured and case was labeled as positive or negative. After that, PGE1 50 ug was used and females were waited for labor to be started and normal delivery occurrence. Data was entered and analyzed using SPSS version 16.0. **Results:** The mean bishop score of females after induction was 6.78±2.66. There were 171 (78%) females who had bishop score >5 while 49 (22%) had bishop score <5. The mean cervical length of females after induction was 26.40±3.69mm. There were 154 (70%) females who had cervical length <27mm while 66 (30%) had cervical length >27mm. The mean induction to delivery interval was 23.01±4.66hours. There were 130 (59%) females who delivered within a period of 24 hours while 90 (41%) delivered after 24 hours. The calculated specificity, sensitivity, positive predictive value, negative predictive value along with diagnostic accuracy of Bishop score were 31%, 84%, 64%, 57% and 62% respectively. The calculated specificity, sensitivity, positive predictive value, negative predictive value along with diagnostic accuracy of cervical length were 59%, 90%, 76%, 80% and 77% respectively. **Conclusion:** Cervical length assessment on TVS had more accuracy than bishop score in primigravidas presenting at term for induction of labor helping avoidance of post-term pregnancy.

Key words: Bishop Score, Cervical Length, Delivery Interval, Induction of Labor.

INTRODUCTION

Most successful induction of labour is when cervix is 'ripe' at the time of labor induction. When cervix changes in consistency prior to onset of labour, ripening occurs. Collagen material and cross-linking declines while water content increase in this process.[1] Bishop score assessment is used in routine to predict whether a female will go in normal labor or not otherwise cesarean is done.[1] Ultrasonography used to measure cervical length is a more attractive option that predicts the success of induction of labour.[2,3] TVS is considered a useful technique for the assessment of the length of cervix and the morphological attributes of the internal cervical os. Even when the external os is closed, TVS is useful.[3] Not much research has gone on to systematically assess the efficacy of Bishop score regarding the success of labour induction. Similar results have been found when bishop's score (n=454) and ultrasonographic measurement of the length of cervix (n=677) were compared.[3] Bishop score has not always shown to be the perfect choice for determining successful labour induction,[4] but that does not mean that the it is of no use. Bishop score has got its own benefits in finding out the ripeness of cervix or whether further dose of prostaglandins are required to attain ripeness. Bishop score

limitations too when it is used alone to determine the outcome of induction of labour. For assessing cervical length, TVS has shown to be helpful and better as compared to digital examination.[4,5]

Through this study we wanted to evaluate that either we can rely on new technique i.e. assessment of successful induction of labor through TVS instead of depending on old traditional method i.e. Bishop score. If this would be proved through this study that Bishop score has low diagnostic accuracy, then we would be able to employ the use of TVS as a feasible method.

MATERIAL AND METHODS

Department of Obs and Gynae of Civil Hospital, Bahawalpur was the centre for this cross sectional study. The study duration was Nov 1st 2016 to April 30th 2017. Total 220 females were included through non probability, purposive sampling. All the women were primigravidas, 18 to 40 years of age and who had completed 41 weeks of gestation. Patients having multiple pregnancies, non-cephalic presentation, PPROM/PROM and High risk pregnancies like PIH (BP>140/90mmHg), pre-eclampsia (PIH with +1 protein urea on dipstick) or eclampsia (pre-eclampsia with convulsions) or gestational diabetes (BSR>200gm/dl) were not included.

After taking consent from hospital ethical committee, patients were informed about the advantages and disadvantages, and their verbal consent were taken for this study. Females underwent vaginal examination and Bishop score was noted and case was labeled as positive (Bishop score≥ 5) or negative (Bishop score < 5). Then females underwent TVS and cervical length was recorded by taking distance between internal cervical os and external cervical os, and case was labeled as positive (i.e. length≤27mm) or negative (i.e. length >27mm). Then females were induced by using PGE1 50 ug and were waited for labor to be started and normal delivery occurrence.

All the readings were recorded on specially designed Performa. Mean and standard deviation were calculated for quantitative variable like age, gestational age, bishop score and cervical length. Percentage was calculated for cases having successful induction of labour. Sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy of TVS and Bishop's score were calculated acquiring successful induction (delivery occurs within 24 hours) as gold standard.

RESULTS

There were 220 females included in this study with the mean age of 27.59±7.04 years. The minimum age of females was 18 years while maximum age was 40 years. The mean gestational age of females at time of presentation was 41.47±0.50weeks. The minimum gestational age of females was 41 weeks while maximum gestational age was 42 weeks. The mean bishop score of females after induction was 6.78±2.66. The minimum bishop score of females was 2 while maximum bishop score was 13. The mean cervical length of females before induction was 26.40±3.69mm. The minimum cervical length of females was 21mm while maximum cervical length was 35mm. The mean induction to delivery interval was 23.01±4.66hours. Induction to delivery range was 14 to 39 hours. There were 130 (59%) females who achieved success (delivery within 24 hours) while 90 (41%) could not achieve success. (Table-I) There were 130 (59%) females who achieved success, out of which 109 (83.8%) were positive for bishop score (>5) while 21 (16.2%) had negative bishop score (<5). Among 90 (41%) females who could not achieved success, 62 (68.9%) had positive bishop score (>5) while 28 (31.1%) had negative bishop score (<5). The calculated specificity, sensitivity, positive predictive value, negative predictive value and diagnostic accuracy of Bishop score were 31%, 84%, 64%, 57% and 62% respectively. (Table-II)

There were 130 (59%) females who achieved success, out of which 117 (90.0%) had cervical length <27mm while 13 (10.0%) had cervical length >27mm. Among 90 (41%) females who could not achieved success, 37 (41.1%) had cervical length <27mm while 53 (58.9%) had

cervical length >27mm. The calculated specificity, sensitivity, positive predictive value, negative predictive value and diagnostic accuracy of cervical length were 59%, 90%, 76%, 80% and 77%. (Table-III)

Success	Number (%)
Yes	130 (59.1%)
No	90 (40.9%)
Total	220 (100%)

Table-I. Distribution of success (delivery within 24 hours) achieved after induction with PGE1-50 microgram.

Bishop Score > 5	Success		Total
	Yes	No	
Yes	109 (83.8%)	62 (68.9%)	171 (77.7%)
No	21 (16.2%)	28 (31.1%)	49 (22.3%)
Total	130 (100%)	90 (100%)	220 (%)

Table-II. Comparison of bishop score in determining success: (delivery within 24 hours)

Cervical Length <27mm	Success		Total
	Yes	No	
Yes	117 (90.0%)	37 (41.1%)	154 (70.0%)
No	13 (10.0%)	53 (58.9%)	66 (30.0%)
Total	130 (100%)	90 (100%)	220 (100%)

Table-III. Comparison of cervical length measurement (<27mm) on transvaginal USG in predicting success (delivery within 24 hours)

DISCUSSION

The most common indications for induction of labor are prolonged pregnancy, PROM or medical disorders with pregnancy.[6,7] Around 20% females having induction of labor require a cesarean for delivery. An objective criteria to predict the successful induction of labor needs to be better understood.[8,9]

Difference of digital assessment of cervix amongst members of the medical team brings about the commonest challenge in the labor wards. The key cause behind this challenge is the subjective nature of digital examination of the cervix, especially regarding the assessment of the cervical length.[10]

The choice of induction agent influence the duration of labor and the outcome.[11] A standardized cervical scoring system was introduced by Bishop in 1964 and it took global acceptance by the name of Bishop's score.[12] Different researchers, using Bishop's score, have recorded different predictive values for the outcome of induction of labour.[13,14]

In our study, the accuracy of cervical length assessment was higher than that of bishop's score. A study conducted by Elghorori MR & colleagues found similar results. Cervical length predicted sensitivity of 62% and specificity of 100% whereas Bishop's score forecasted vaginal delivery with a sensitivity of 23% and specificity of 88%. TVS was labeled better than Bishop's score in prediction of successful induction of labor.[4]

TVS was noted as less painful by Tan and colleagues in comparison to digital examination. Cervical length along with modified Bishop's score were predictors of the success of induction with optimal cut off points of 20mm for the cervical length and ≤ 5 for the modified Bishop's score. The researcher also found that cervical length recorded by TVS had superior sensitivity (80% versus 64%) than the modified Bishop's score.[15]

Another study reported different results that TVS had sensitivity of 59% and specificity of 78% whereas the Bishop's score's sensitivity was 65% and specificity 78%. TVS evaluation of the cervix before induction of labor did not result in improvement of the prediction noted by the Bischop Score.[15]

CONCLUSION

Cervical length assessment on TVS had more accuracy than bishop score in primigravidas presenting at term for induction of labor helping avoidance of post-term pregnancy.
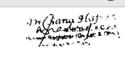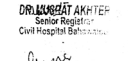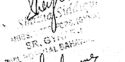**Copyright© 25 Dec, 2018**

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
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2	Musrat Akhter	Drafting an article literature search.	
3	Shazia Siddique	Data analysis & interpretation.	
4	Salma Jabeen	Final approval of version.	