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Original Research Article

ROLE OF TRANSVAGINAL SONOGRAPHIC CERVICAL ASSESSMENT AND MANNUAL BISHOP SCORING IN ANTICIPATING LABOR INDUCTION SUCCESS AT TERM

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ABSTRACT

Background: "Labour" is the phrase that refers to all stages of childbirth. Induction of labour is a common obstetric procedure performed to initiate uterine contractions before the spontaneus onset of labour. The sucess of Induction largely depends on the readiness of the cervix. Traditionally, the Bishop score has been used to assess cervical favourablility manually, while transvaginal sonographic measurement of cervical length provides an objective and reproducible assessment. Comparing these two methods can help to determine which is more accurate in predicting sucessful Induction of labour. The objective is to compare the Bishop's Score and transvaginal ultrasound, which one is better at predicting sucessful induction of labour. Prospective observational cohort Study. This study was conducted in Karachi Medical and Dental College / KMU Karachi Abbasi Shaheed Hospital Karachi from June 2024 to June 2025.

Materials and Methods: This is a cross-sectional analysis which include all those pregnant women who are planned for induction of labour at 40 weeks gestation. All of the participants were assessed by inclusion and exclusion criteria. Moreover, those who did not have any medical comorbid and contraindication for vaginal birth were recruited and assessed by vaginal examination and the Bishop Score was calculated and classified as unfavourable or favourable. Following that, transvaginal ultrasonography was performed at the same time and sonographic assessment of cervical length noted. SPSS version 21 was used to analyse the data.

Results: There were a total of 200 people included in this study. The mean age of participants were 18 years to 36 years. The majority of the women had normal vaginal delivery, representing 62% of the total sample (n=124). The results showed that the mean age was higher in the c-section group (30.21 years) while it was 28.32 years in the vaginal birth group. Women who delivered with c-section had a higher mean sonographic cervical length as compared to digital Bishop score assessment. Thus transvaginal sonographic cervical length may provide a more objective and reproducible prediction.

Conclusion: The accuracy of transvaginal sonography of cervical length is higher than the accuracy of the digital Bishop Score.

Keywords: Labour, obstetric, or fetal problems, cervix, Cervical length

INTRODUCTION

"Labour" is the phrase that refers to all stages of childbirth. It includes the latent stage and placenta delivery.[1] When the mother starts getting regular contractions, the latent period starts. When the cervical dilatation reaches 3-4 cm, most women's latent phases end there.[2] This point is very crucial as it helps the doctors know when active labour is likely to begin. Induction of labour (IOL) is done before labour begins on its own.[3] It means uterine contractions start using surgical or medical methods. IOL is done when there are any medical, obstetric, or fetal problems in the mother. This way, it is safer for the baby to be born sooner. Induction of labour is mostly done in those cases where the reasons are either medical conditions or PROM that occur during pregnancy.

About 18% of the women end up needing a caesarean section when they are induced.[4] This is why it becomes clear why we need more ways to predict if inducing labour will work. One problem is common in the labour ward that different doctors or midwives may give different digital (finger) assessments of the cervix.[5] It depends on the person doing this exam because it is quite subjective that the cervical length is checked by touch. The main reason why the cervix is checked before inducing labour is to help decide the induction agent to use (method or medicine).[6] It can affect how long labour takes and how it ends. Several scoring systems have been developed to help with this and make cervical assessment more reliable. This includes the well known Bishop score as well.

The number of labour inductions have gradually increased over the past 20 years.[7] According to research, more than 20% of all births involve induction in many countries.[8] Furthermore, about 20% of these inductions lead to a c-section.[9] The most common methods that are used to check the cervix before inducing labour are the transvaginal ultrasound and Bishop Score. Cervical length is measured through these methods. To check whether a woman is ready for a successful vaginal delivery or she needs labour induction, Bishop Scoring is used. There are several parts of the Bishop Score. They are the following; dilation, location, effacement, consistency, and station. Dilation means how open the cervix is and it is measured in centimetres from 0-10. Location defines the position of the cervix in the pelvis. Effacement refers to how thin the cervix has become. The cervix becomes thinner as effacement progresses. Consistency refers to how firm or soft the cervix feels and station refers to how far the fetus has moved down into the pelvis. When the cervix is fully effaced, it becomes soft and ready for normal delivery.

In order to compare different ways of predicting how successful labour induction would be, Sharma et al. conducted a study where they looked at the results of earlier research which were conducted on this topic.[10] 9 out of 13 studies showed that cervical length was proved to be a better predictor of successful labour induction than the Bishop Score. However, there were 3 studies which showed that the Bishop's Score was also helpful but not better than cervical length measurement. There was only 1 study that showed the Bishop Score as better than cervical length. According to a Cochrane review, there was no significant difference seen between the Bishop's Score and transvaginal ultrasound.[11] Therefore, we conducted this study to compare both the methods, the Bishop's Score or transvaginal ultrasound, and see which one is better at predicting if labour induction will be successful.

MATERIALS AND METHODS

This is a cross-sectional analysis which included a total of 200 pregnant women. All the participants who visited outpatient department of Obstetrics and Gynaecology and recruited for induction of labour at 40weeks of gestation fullfilling the inclusion criteria were involved in this study. To select the sample, a non-probability consecutive sampling method was used. The Ethical Review Committee approved this research and on the approval, we started to gather the data. Every participant was informed about the study and their signed informed consent was obtained. Confidentiality was upheld related to both their non-medical and medical information. All of the participants were females who were pregnant and were at term (more than 40 weeks gestation). A predesigned proforma was filled which includes demographic data, past obstetrical history, manual Bishop Score and sonographic cervical length of the same day. Moreover, patient fulfill all the criteria for induction of labour and all contractions for vaginal delivery must be ruled out.

Exclusion criteria

Women who were pregnant and had hypertension, gestational diabetes, eclampsia, and pre-eclampsia were not a part of this research. Moreover, pregnant women with fetal abnormalities, ruptured membranes, and fetal death were also not a part of this study. Furthermore, women who had a history of c-section delivery and emergency delivery rationale were also excluded.

For continous data comparison (cervical length and bishopscore) t- test is used and for categorical outcome comparison chi- Square test is used. Sensitivity, specificity, negative predictive and positive predictive value calculated and compared.

Patient was assessed in outpatient department initially and sonographic cervical length measured at the same time. After a vaginal examination, based on the Bishop Score, the cases of the participants were classified as unfavourable. All participants' bladders were emptied before the examination. Following that, they were checked in the dorsal lithotomy position. In this position, the females are lying on their back with legs raised and supported.

Then, a side view (sagittal plane) was taken once the cervical canal, internal cervical os, and external cervical os were seen clearly. The distance between external and internal cervical os was referred to cervical length. If the cervical length was <27 mm it is considered favourablecervixand if the cervical length was >27 mm it is considered unfavourable cervix. If the patient had a vaginal delivery within 24 hours after TVS showed a cervical length of 27 mm or less, this was considered as a successful induction based on TVS. On the other hand, the Bishop Score was used to check whether the cervix was ready for labour or not. If the score was 5 or more, it means the cervix was ready and the case is favourable. If the score was less than 5, it means the case was unfavourable. If the patient had a vaginal delivery within 24 hours after having a Bishop Score of 5 or more, this was considered as a successful induction based on the Bishop Score.

Following all these findings, other information like age, gestational age, weight, BMI, and number of previous births were noted down on a special data sheet called proforma. SPSS version 21 was used to analyse the data. Qualitative variables were expressed in terms of percentages and frequencies while quantitative variables were expressed in terms of mean and standard deviation. Chi-square test was conducted for qualitative variables. An independent sample t-test was conducted for quantitative variables. When p-value was less than 0.05, it was considered as statistically significant.

RESULTS

There were a total of 200 people included in this study. All the participants were aged from 18 years to 40 years. The majority of the women had normal vaginal delivery, representing 62% of the total sample (n=124). The results showed that the mean age was higher in the c-section group (30.21 years) while it was 28.32 years in the vaginal birth group. [Table 1] shows the demographic data of the participants.

Table 1

Variables	Vaginal Birth (n=124)		C-Section (n=76)	
	N	%	N	%
Age (yrs)				
Below 35	97	78.2	58	76.3
Above 35	27	21.8	18	23.7
Parity				
Parous	74	59.6	31	40.8
Nulliparous	50	40.4	45	59.2
Mean values + SD				
Gestational Age (yrs)	38.6 ± 1.2		38.7 ± 1.3	
BMI	26.2 ± 4.1		28.4 ± 6.3	
Height (cm)	156.1 ± 4.8		155.9 ± 5.1	
Weight (kg)	64.5 ± 12.8		67.7 ± 14.5	

Women who delivered with c-section had a higher mean cervical length as compared to those who had vaginal delivery. [Table 2] shows feto-maternal characteristics of both the groups.

Table 2

Variables	Vaginal Birth (n=124)		C-Section (n=76)	
Cervical length (mm)	24.8 ± 7.5		27.9 ± 7.1	
Cervical Funneling				
Absent	48	38.8%	45	59.2%
Present	76	61.2%	31	40.8%
Bishop Score Median	6		3	
Induction to delivery interval	32.4 ± 22.4		42.6 ± 28.3	
Birth Weight	3.1 ± 0.3		3.1 ± 0.4	

[Table 3] shows cross tabulation of successful labour induction.

Table 3

Methods	Successful induction of labour		Total
	Yes (n=124)	No (n=76)	
Bishop Score (>5)			
Yes	99	49	148
No	25	27	52
Total	124	76	200
Cervical length (<27 mm)			
Yes	108	33	141
No	16	43	59
Total	124	76	200

[Table 4] shows the accuracy of both the methods for successful induction of labour.

Table 4

Statistics	Cervical Length (<27 mm)	Bishop Score (>5)
Positive Predictive Value	76.09%	65.98%
Negative Predictive Value	74.36%	52.94%
Sensitivity	87.5%	80.0%
Specificity	56.86%	35.29%
Accuracy	75.57%	62.60%

DISCUSSION

Before induction, it is important to evaluate the cervical condition because it links with the likelihood of successful vaginal delivery. This helps the clinicians in advising women about the method for delivery and optimise the results of labour induction. The results of our study shows that measuring the transvaginal cervical length prior to inducing labour was found to be an independent and reliable predictor of effective labour induction. These results are similar to the results of other studies that have determined the importance of measuring cervical length before labour induction.[12,13]

Due to its ligamentous support and high collagen content, the cervix plays an important role in labour. Therefore, cervical measures are mostly used in studies to predict the success of inducing labour.[14] Studies have revealed that cervical factors give contradictory findings because there is no consistency in the results.[15] It is due to the vulnerability of the cervical as it changes because of the pressure from the pelvic organs. The cervical also changes when the uterus or fetus expands. Theory says that during cervical effacement, the cervix shortens and extends the lower uterine segment. Findings related to the accuracy of sonographic cervical length measurement are conflicting in the literature. Studies also indicate that the Bishop's Score had a greater specificity and sensitivity.[16-18]

In our study, transvaginal ultrasound was used to assess the cervical length measurements to compare with the Bishop Score. It was done to predict the outcome of induction of labour. Women who delivered with c-section had a higher mean cervical length as compared to those who had vaginal delivery. These results are aligned with the study of Hassan SSM who says that the mean cervical length was significantly lower in women who had successful induction of labour (28.76 ± 3.93).[19]

Our study shows that the specificity and sensitivity on the basis of cervical length was higher as compared to the Bishop Score (56.86% and 87.5%). Similarly, the Bishop Score had lower positive predictive value and negative predictive value. The cervical length had higher values (76.09% and 74.36%). Overall, the cervical length had more accuracy than the Bishop Score. The accuracy of the cervical length was 75.57% as compared to the Bishop Score (62.60%). These findings are similar to the findings of Pandis et al. who found out that cervical length was a stronger predictor than the Bishop Score.[20]

CONCLUSION

The accuracy of transvaginal sonography of cervical length is higher than the accuracy of the Bishop Score.

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