



MODIFIED BISHOP'S SCORE IN PREDICTING INDUCTION TO DELIVERY INTERVAL IN PRIMIGRAVIDA

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Abstract:

Human cervical connective tissue contains both estrogen and progesterone receptors. As term approaches, there is down regulation of both estrogen and progesterone receptors, which may be caused by increased turnover of the receptor proteins. Estrogen and its precursors have been shown to stimulate collagenase production in the pregnant human cervix. Progesterone inhibit cervical tissue from producing intrleukin-8. Transvaginal cervical length will be measured in mm with the standard longitudinal view of the cervix after asking patient to empty bladder using PHILIPS HD 5 machine. The image will be enlarged so that the cervix occupies at least two-third of the image and external os and internal os are well seen. Three consecutive cervical images will be obtained and three separate readings of cervical length was taken and then average cervical length in mm will be considered for the study. Modified Bishop's score at ≤ 4 had Sensitivity of 62.5%, Specificity of 91.67%, PPV of 95.2%, NPV of 47.8% in predicting Successful labour

Keywords: Modified Bishop's Score, Induction To Delivery Interval, Primigravida

Introduction:

Smooth muscle cells and fibroblasts make up the cellular component of the human uterine cervix. Early in gestation, turnover of both smooth muscle and fibroblast is initiated. The cervix undergoes hyperplasia as these cells proliferate. As the pregnancy advances, physiologic cell death occurs. Decorin suppress the further cell proliferation, which accounts for further increases in decorin levels; a process that helps to disperse collagen fibrers. This disorganization of collagen then aids in an influx of water and aids in increasing the ability of the cervix to distend.¹

These factors are responsible for increasing the water content in the cervix, decreasing the collagen concentration, and collagen restructure. Decorin is responsible to cause tight alignment of collagen fibrils and the ratio of decorin to collagen correlates with the softness of the cervix in a increase manner.²

The Second mechanism is enzymatic degradation of the extracellular matrix. Collagenases, Matrix metalloproteinases (MMP I & 8) which cleave the collagen helices and Elastases are the enzymes involved in this late restructuring of the cervix.

Hyaluronic acid has also been shown to stimulate the synthesis of proteolytic enzymes by cervical fibroblasts Hyaluronic acid level increases with cervical ripening and increase dramatically in the cervix with the onset of labour. It has got an important role in increasing the water content of the

cervix at term. It also has a role in neovascularization, a process noted with cervical ripening. Hyaluronic acid increases the chemotactic response of neutrophils.³

Human cervical connective tissue contains both estrogen and progesterone receptors. As term approaches, there is down regulation of both estrogen and progesterone receptors, which may be caused by increased turnover of the receptor proteins. Estrogen and its precursors have been shown to stimulate collagenase production in the pregnant human cervix. Progesterone inhibit cervical tissue from producing interleukin-8. Fetal Fibronectin (FFN) concentrations in the cervical transudate represent a laboratory approach and have been shown to correlate with induced labour outcome with concentration <50mcg /ml associated with a favourable cervix. A positive FFN was associated with significantly shorter delivery intervals than when a negative FFN result is obtained.⁴

In 1964, Bishop described a scoring system for determining a patient's suitability for elective induction of labor. This pelvic score, which has become known as the Bishop score, was based on those factors that had been previously found to correlate with ripeness. The rate of labour progression relates to certain identifiable prelabour characteristics of the cervix.

Methodology:

STUDY DESIGN

Comparative study

SAMPLE SIZE

100 primigravida admitted in Department of OBG

INCLUSION CRITERIA

1. Primigravida with singleton pregnancy with 37-42 weeks of gestation.
2. Live fetus with cephalic presentation.

EXCLUSION CRITERIA

1. Scarred uterus
2. Antepartum hemorrhage
3. Non reassuring fetal heart rate
4. Contracted pelvis
5. <37 weeks and >42 weeks of gestation
6. Multiple pregnancy
7. Congenital malformation of the fetus
8. Intrauterine fetal demise
9. Any contraindications to vaginal delivery
10. Fetal mal-presentations

METHOD OF COLLECTION OF DATA

Transvaginal cervical length will be measured in mm with the standard longitudinal view of the cervix after asking patient to empty bladder using PHILIPS HD 5 machine. The image will be enlarged so that the cervix occupies at least two-third of the image and external os and internal os are well seen. Three consecutive cervical images will be obtained and three separate readings of cervical length will be taken and then average cervical length in mm will be considered for the study.

After sonography, modified Bishop's score will be determined by digital examination.

Induction will be done by Prostaglandin E2 gel. Maximum of 3 doses 6 hrs apart will be repeated. The induction active phase interval, induction to delivery interval and the mode of delivery will be noted. Failed induction is defined as an inability to achieve the active phase of labor corresponding to cervical dilatation of >4cm within 24hr of onset of induction. Study population will be divided into group A and group B. Modified Bishop's score with equal to or >4 and Transvaginal ultrasonographic cervical length equal to or <28mm will be induced. The data will be analysed to compare Modified Bishop's score and Transvaginal ultrasonographic cervical length for prediction of successful labor induction in term primigravida.

Results:**Table 1: Age distribution comparison between two groups**

		Group					
		Group A		Group B		Total	
		Count	%	Count	%	Count	%
Age	<20 years	21	42.0%	23	46.0%	44	44.0%
	21 to 25 years	28	56.0%	24	48.0%	52	52.0%
	>25 years	1	2.0%	3	6.0%	4	4.0%
	Total	50	100.0%	50	100.0%	100	100.0%

In Group A, 42% were <20 years, 56% were in 21 to 25 years and 2% were >25 years.

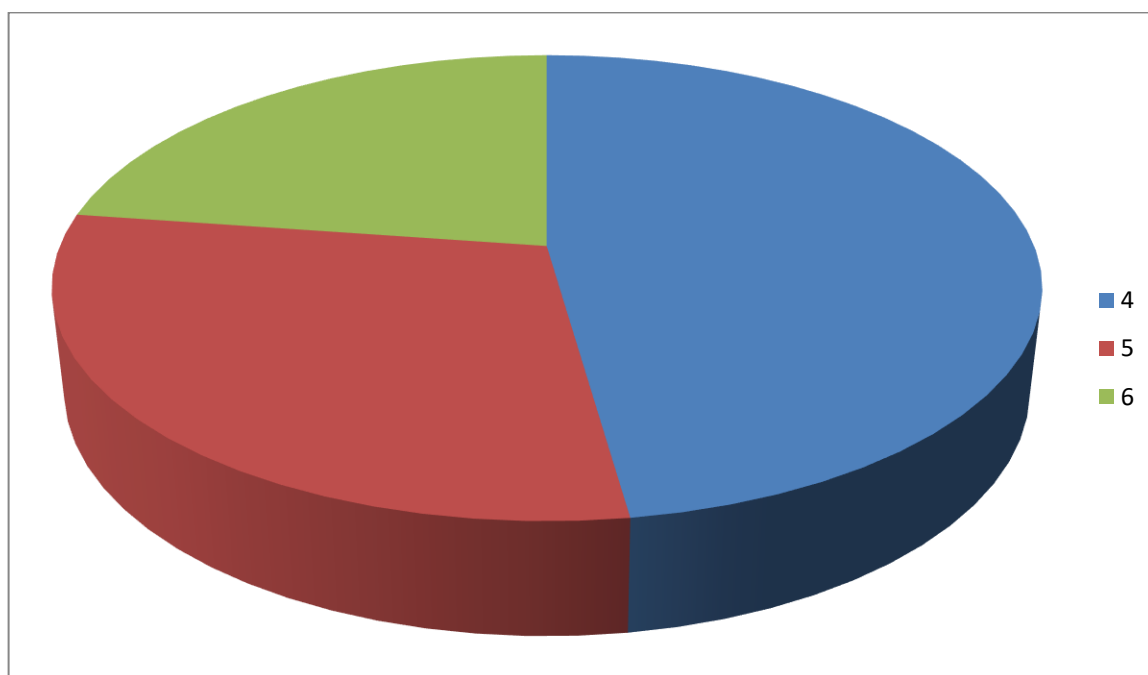
In Group B, 46% were <20 years, 48% were in 21 to 25 years and 6% were >25 years.

Table 2: Modified bishop's score distribution

		Count	%
Modified bishop's score	4	21	47.7%
	5	13	29.5%
	6	10	22.7%

Mean Modified bishop's score was 4.75 ± 0.811

In the study, 47.7% had Modified bishop's score of 4, 29.5% had Score 5 and 22.7% had Score 6.

**Figure 1: Pie Diagram Showing Modified bishop's score distribution****Table 3: Modified bishop's score in Predicting Induction to delivery interval**

Area under the ROC curve (AUC)	0.814
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Modified Bishop's score at ≤ 4 had highest validity in predicting the success of labour.

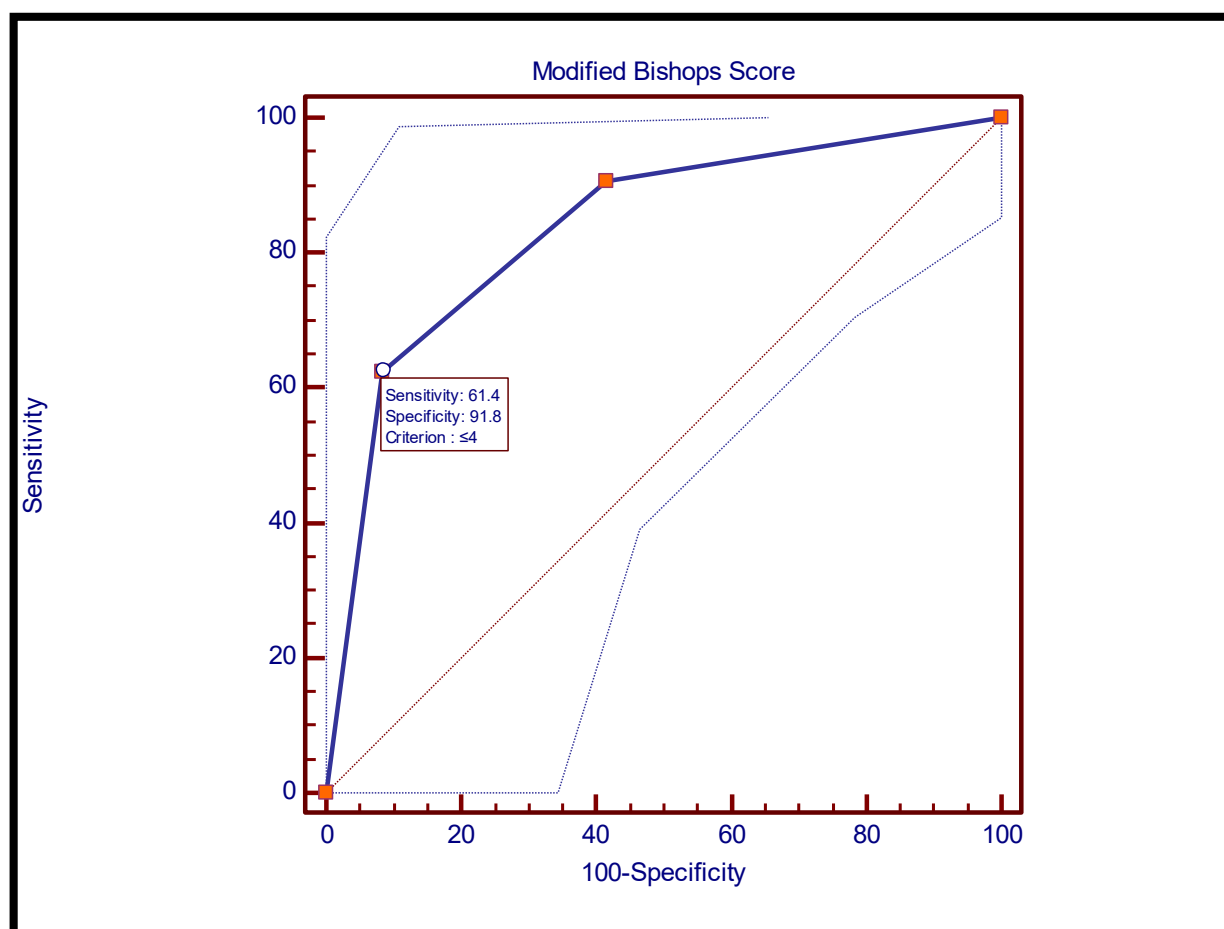


Figure 2: ROC Curve showing Modified bishop's score in Predicting Induction to delivery interval

Modified Bishop's score at ≤ 4 had Sensitivity of 62.5%, Specificity of 91.67%, PPV of 95.2%, NPV of 47.8% in predicting Successful labour.

Discussion:

Cervical dilatation is determined by estimating the average diameter of the cervical opening by sweeping the examining finger from the margin of the cervical opening on one side to that on the opposite side. The diameter traversed is estimated in centimeters. The cervix is said to be dilated fully when the diameter measures 10cm because the presenting part of a term – size new born usually can pass through a cervix this widely dilated.⁵

The level or station – of the presenting fetal part in the birth canal is described in relationship to the ischial spines, which are halfway between the pelvic inlet and pelvic outlet. When the lowermost portion of the presenting fetal part is at the level of the spines, it is designated as being at zero station. The position of the cervix is determined by the relationship of the cervical OS to the fetal head and is categorized as posterior, mid position, or anterior: Along with position, the consistency of cervix is determined to be soft, firm, or intermediate between these two.⁶

The degree of cervical effacement usually is expressed in terms of the length of the cervical canal compared with that of an uneffaced cervix. When the cervix becomes as thin as the adjacent lower uterine segment, it is completely, or 100% effaced.

Modifications of the Bishop score were proposed in an effort to increase its predictability for successful induction and decrease morbidity rates associated with induction.⁷

Several studies have shown association of Bishop's score and duration of induced labor. In 1977,, Harrison et al found a significant increase in the Bishop's score which they assessed at 36 weeks and 40 weeks of gestation. Patients with a score of 7 or more delivered in less than 9 hours 87% of

the time, whereas patients having score of 4 or less delivered within this interval only 44% of the time.⁸

In 1982, Lange et al confirmed that the Bishop score, as used in Denmark with effacement expressed as centimeters of cervical length correlated well with the likelihood of successful induction after evaluating 1,189 patients who underwent induction of labor. They found that cervical dilation was at least twice as important as the other factors considered in the Bishop score.^{9,10}

Conclusion:

Modified Bishop's score at ≤ 4 had Sensitivity of 62.5%, Specificity of 91.67%, PPV of 95.2%, NPV of 47.8% in predicting Successful labour

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