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Original Research Article

## Evaluation of pre induction scoring by clinical examination vs transvaginal sonography

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### ABSTRACT

**Background:** The aim of the study was to find out pre-induction cervical length by TV Sonography, determine Bishops score and to co-relate the obstetric outcome with these two variables.

**Methods:** A study was done on 100 women with singleton pregnancies at 37-42 weeks of gestation, admitted for induction of labour in the Department of Obstetrics and Gynaecology at SGRDIMSR, Vallah, Amritsar, Punjab, India. All women underwent cervical assessment by both transvaginal ultrasound and Bishop Score and the outcome of labour induction was determined.

**Results:** Of the 100 women, 53 women had vaginal delivery and 47 landed into LSCS. Bishop score < 6 and cervical length > 3 cm are cut off values of cervical unfavourability. Successful induction was achieved among 87.5% and 78% women with favorable cervix according to Bishop Score and Cervical length respectively. Among the 92 and 50 women with unfavourable cervix according to Bishop score and cervical length, 48 (52.17%) and 14 (28%) had vaginal delivery respectively.

**Conclusions:** Hence, cervical length by transvaginal ultrasound is a better predictor for the success of induction of labour as compared with assessment by Bishop Score alone.

**Keywords:** Bishop score, Cervical length, Labour induction, Transvaginal ultrasound, Vaginal delivery

### INTRODUCTION

Induction of labour, an obstetrical technique practiced since times immemorial is carried out in approximately 20% of pregnancies.<sup>1</sup> 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 mortality.<sup>2</sup> However, approximately 20% of women having induction of labour end up having a Caesarean delivery. Successful induction of labour depends on length, position, softness and dilatation of cervix. The Bishop score, since its description in 1964, remains the gold standard for assessing favourability for induction of labor.<sup>3</sup> The classical digital examination is subjective and has intra and inter observer variability. Transvaginal ultrasound has been used successfully for

measuring the length of cervix to predict duration of labour and obstetric outcome after labour induction. This method has been compared with the Bishop score achieving controversial results.<sup>4</sup> On one hand it has been reported that the length of the uterine cervix, measured by transvaginal ultrasound, is a better predictor of the risk of Caesarean section after induction of labour for medical reasons than is the Bishop score.<sup>5</sup> On the other hand it has been stated that transvaginal ultrasound does not improve on the prediction of cervical inducibility obtained by the Bishop score.<sup>6</sup>

Recently measurement of cervical length by transvaginal ultrasonography for prediction of success of induction of labour is being used which is having more reproducibility.<sup>7</sup> It has been investigated as a way of predicting the likely outcome of induced labour as an

alternative to clinical digital examination described by Anderson in 1991 and others.<sup>8-12</sup> The elective induction can be done in various methods.

The use of intravenous oxytocin in induction of labour increased gradually since 1950 after the discovery of oxytocic effect of the posterior pituitary extract by Dale in

1906 and the synthesis of the Uterotonin by Du vignaud in 1950.<sup>13</sup> The first systemic study of prostaglandin was by Kurzork and Liebin in 1930. At present prostaglandins are used in big way in induction of labour.<sup>14</sup>

**Table 1: Bishop system of cervical scoring.**

Assessment score	Dilation (cm)	Effacement (%)	Fetal station	Consistency	Position
0	0	0 to 30	- 3	Firm	Posterior
1	1 to 2	40 to 50	- 2	Medium	Mid
2	3 to 4	60 to 80	- 1, 0	Soft	Anterior
3	5 to 6	90 to 100	+1, +2, +3	—	—

Oxytocin and prostaglandins have been used for induction of labour in this study as these are considered safe and effective. There are many maternal and fetal indications for induction of labour, among them full term pregnancy is probably the commonest indication.<sup>14</sup> In our study we have also taken past dates, pregnancy induced hypertension, PROM, oligohydramnios and latent labour as indications for induction. Though induction of labour has its own hazards like iatrogenic prematurity and associated perinatal mortality etc., but it has always been that the gains are on higher side in properly selected cases.

The present study was undertaken to evaluate the role of Bishop Score, cervical length by transvaginal ultrasound in predicting the outcome of labour induction at term gestation using misoprostol tablets.

The aim of the study was to find out pre-induction cervical length by TV Sonography, determine Bishops score and to co-relate the obstetric outcome with these two variables.

**METHODS**

The present study was done on 100 women with singleton pregnancies at 37-42 weeks of gestation, from October 2014 to June 2016, admitted for induction of labour in the Department of obstetrics and gynaecology at SGRDIMSR, Vallah, Amritsar. A detailed history was

taken from all patients followed by general and systemic examinations. Transvaginal ultrasound assessment of cervical length was done followed by per vaginal examination for cervical assessment according to Bishop Score.

Bishop score  $\leq 6$  and cervical length of  $> 3$  centimeters was taken as unfavourable cervix. In case of unfavourable cervix, induction was done using 25 micrograms Misoprostol tablet per vaginally, repeating the dose in 6 hourly until maximum of three doses. All cases followed with partographic representation. The primary outcome was taken as vaginal delivery with or without instrumental delivery. Cases landing in cesarean section were considered as failed inductions.

**Table 2: Comparing the BS and CL by TVS in predicting primary outcome.**

Parameters	No. of women	Vaginal delivery	
		No of women	Percentage
BS	$\leq 6$	92	48 52.17%
	$>6$	8	7 87.50%
CL	$> 3\text{cm}$	50	14 28.00%
	$\leq 3\text{ cm}$	50	39 78.00%

\*BS - Bishop score, CL - Cervical length, TVS - Transvaginal ultrasound.

**Table 3: Assessing the combined effect of BS and CL by TVS in predicting primary outcome.**

Total no. of women	BS	No of women	CL	No of women	Vaginal delivery within $\leq 24$ hrs	%
100	BS $\leq 6$	92	CL $> 3\text{cm}$	44	15	34
			CL $\leq 3\text{cm}$	48	33	68
	BS $> 6$	8	CL $< 3\text{ cm}$	7	6	85.7

**Table 4: Comparison of statistical analysis of similar studies.**

Study	VD (%)	CS (%)	Statistical analysis	Better predictor
Ware et al	69	31	Logistic regression CL ( $r^2=0.28$ , $p < 0.02$ )	CL
Chandra et al	80	20	Logistic regression, BS ( $p < 0.01$ )	BS
Gabriel et al	70.4	29.6	ROC CL ( $p=0.006$ )	CL
S H Yang et al	75	25	X2 test, CL ( $p=0.001$ ), BS ( $p=0.045$ )	CL
Gomes et al	72.8	27.2	X2 test, BS ( $p=0.000$ ) CL( $p=0.000$ )	CL,BS
Halil et al	69.9	30.1	Logistic regression CL ( $p=0.0101$ )	CL
Daskalaiset al	67.1	32.9	AOC, CL ( $p < 0.01$ )	CL
Elghorori et al	83.7	16.3	CL (Sen-62.1%, Spe-100%)	CL
Strobel et al	94	6	Logistic regression, CL ( $p < 0.0001$ ), BS ( $p=0.001$ )	CL,BS
Anish et al	76.8	23.2	Logistic regression, CL ( $p=0.000$ )	CL
P C Tanet al	77.9	22	Logistic regression, CL ( $p=0.005$ )	CL
Gouri et al	90	10	X2 test, CL ( $p=0.00001$ )	CL,BS
Present study	53	47	X2 test, CL ( $P=0.000$ )	CL

VD - Vaginal delivery, CS - Cesarean section, AOC - Area of curve.

## RESULTS

The indications for induction of labour were full term pregnancy (66%), past dates (7%), pregnancy induced hypertension (4%), latent labour (9%), PROM (7%) and oligohydramnios (7%). In present study, 53 women had successful induction i.e. vaginal delivery as favoured primary outcome. In 47 women cesarean section was done.

When Bishop Score was taken into consideration, among the 100 women,  $BS \leq 6$  was seen in 92 women. In them 48 (52.17%) women had vaginal delivery.  $BS > 6$  was seen in 8 women among them 7 (87.5%) women had successful induction. When cervical length by TVS was taken into consideration, 50 women had cervical length  $> 3.0$  cm, in them 14 (28%) women had vaginal delivery. Whereas 50 women had cervical length  $\leq 3.0$  cm, in them 39 (78%) women had successful induction.

Whereas when both the factors combined, 44 women who had both factors unfavourable i.e.  $BS \leq 6$  and cervical length  $> 3.0$  cm, in them 15 (34%) had vaginal delivery. 48 women had  $BS \leq 6$  and cervical length  $\leq 3.0$  cm, in them 33 (68%) had successful induction. Only 1 woman had  $BS > 6$  and CL  $> 3.0$  cm and successful induction was achieved in her case. Whereas 7 women had both factors favourable i.e.  $BS > 6$  and CL  $< 3$  cm, in them 6 (85.7%) had successful induction.

By using chi square test statistical analysis was done. According to the analysis, compared with Bishop Score ( $P=0.54$ ), cervical length alone ( $P=0.000$ ) and Bishop Score combined with cervical length ( $P=0.02$ ) had shown significant relation with successful induction i.e. vaginal delivery within 24 hours.

## DISCUSSION

The current method of evaluation of cervical condition before induction of labour is by Bishop score. But this score can differ from person to person due to more number of variables. This study primarily focused on detecting cervical change and likelihood of success of induction of labour by comparing the cervical length in centimeters measured by transvaginal ultrasound and Bishop Score in women with term gestation.

This study has compared the Bishop Score and cervical length by transvaginal ultrasound as in studies of Daskalakis et al<sup>15</sup> and Anish et al<sup>16</sup>. In studies of Yang et al<sup>17</sup> and Gomes et al<sup>18</sup> also, primigravidae were more in number than multigravidae with 74% and 68.1% respectively. In our study we have taken women with gestational age of 37 to 42 weeks like in studies of Daskalakis et al, PC Tan et al<sup>19</sup>, Yang et al and Halil et al<sup>20</sup>. We have taken past dates, pregnancy induced hypertension and post term as the causes of induction as in studies of Yang et al, Gabriel et al<sup>21</sup>, Halil et al, Gomes et al and Anish et al study.

## CONCLUSION

Cervical length by transvaginal ultrasonography proved to be better in predicting the success of induction of labour by having significant relation with vaginal delivery within 24 hours. Bishop score is also good in predicting the success of induction of labour but it is having comparatively less significant relation with vaginal delivery because of many variables and person to person variability in assessment. Cervical length by transvaginal ultrasonography can be used as an adjuvant

to Bishop Score in assessment of cervix before induction of labour because of its higher predictive value and better tolerability. But cost of the equipment and experience in ultrasound are the drawbacks.

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