

Original Research Article

A PROSPECTIVE OBSERVATIONAL STUDY TO CORRELATE THE CERVICAL LENGTH AT 24-28 WEEKS PERIOD OF GESTATION AND OBSTETRIC OUTCOME AT TERTIARY CARE CENTER

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ABSTRACT

Background: Delivering a healthy baby with safety of mother has been the aim of obstetric care. Cervix is a dynamic organ throughout pregnancy and varies markedly in size and length. Better the effacement and dilatation shorter is the duration of labor and earlier is the delivery. Hence assessment of cervical length may be used in predicting the success of induction of labor. The likelihood of spontaneous preterm delivery increases as cervical length decreases hence routine assessment provides a sensitive predictor of spontaneous preterm labor. **Material & Methods:** A prospective observational study conducted in 200 pregnant women. Cervical length was measured at 24 – 28 weeks period of gestation. Period of gestation at the time of delivery, onset of labour, success of induction of labour and outcome in placenta previa were studied.

Results: Our study showed that the maximum number of cases studied was in the age group of 20 – 25 years. The mean age of patients was 27.28±4.26 years (table 1). Maximum number of patients delivered at 37 – 40 weeks period of gestation (POG). POG is significantly associated with cervical length (mm) with $\chi^2=53.56$; $P<0.05^{**}$. However cervical length does not predict the success of Onset of labour and induction of labour. BMI is significantly associated with cervical length (mm) with $\chi^2=34.27$; $P<0.05^*$. Lower BMI is associated with shorter cervical length and hence is useful for predicting preterm labour in these patients.

Conclusion: Routine assessment of cervical length at 24-28 weeks of gestation is a good indicator of spontaneous preterm delivery.

Keywords: Cervical length, Induction of labour, Preterm labour, Success of Induction, BMI.

INTRODUCTION

Prematurity is the leading cause of neonatal morbidity and mortality with severe emotional sequelae and high economic costs.^[1] The cervix is a dynamic organ having a unique role in parturition, tasked with retention of pregnancy until active labour where it must dilate to deliver the fetus and then return to its original shape to replicate its role in

subsequent pregnancies. Failure of the cervix to retain the pregnancy to term has long been known as cervical incompetence and more recently as cervical insufficiency leading to a cause of preterm birth.

The risk for this pregnancy complication varies with maternal characteristics, such as ethnic origin, age, body mass index (BMI), cigarette smoking and drug abuse, as well as obstetric history. Routine assessment of cervical length provides a sensitive

prediction of spontaneous preterm delivery.^[2,3] The likelihood of a spontaneous preterm delivery increases as the cervical length decreases. Predicting preterm labour helps the obstetrician in improving the neonatal outcome by using steroid induction, tocolysis, conduction of labour in the right place where neonatal intensive care facility exists. Short cervical length measured by transvaginal sonography is used in patients to perform a cervical encircle age thereby reducing the complications related to preterm delivery.

The normal cervical length varies between 3.5cm to 4cm. As term approaches cervix begins to shorten in both size and length resulting in effacement and dilatation. Better the effacement and dilatation shorter is the duration of labour and earlier is the delivery. Hence assessment of cervical length may be used in predicting the success of induction of labour. Imaging modalities such as ultrasonography have produced numerous insights into cervical changes during pregnancy. Current practitioners are most familiar with the measurement of cervical length with transvaginal ultrasonography, but earlier studies used transabdominal approach. Transvaginal cervical length measurement has several technical advantages over the transabdominal approach. The main one is that a full bladder, often necessary to visualize the cervix transabdominally, may falsely elongate a short cervix due to the pressure exerted over the lower uterine segment.^[4,5]

Given these remarkable requirements and the potential for neonatal morbidity and mortality associated with deficient function, it is not surprising that investigators have been fascinated with studying the cervix. Cervix can be assessed digitally or by ultrasound. Ultrasound is a better modality because the upper half of the cervix which cannot be assessed digitally can be measured by ultrasound.^[6] The purpose of this study was to estimate the ability of cervical length, as measured by transvaginal ultrasonography in asymptomatic women, in predicting the onset of labour, period of gestation at delivery, success of induction of labour and outcome in placenta previa.

MATERIALS AND METHODS

A hospital based prospective study done on 200 pregnant women between 24-28wks POG visiting antenatal clinic in Maharana Pratap Government Medical College & Associate group of Bangur Hospital, Pali, Rajasthan, India during one-year period.

Inclusion criteria

- Primigravida and Multigravida patients between 24-28 weeks of gestation, not in labor.

- Single live foetus in Cephalic presentation.
- With Intact Membranes.
- Without any previous uterine scar.

Exclusion criteria

- Women attending antenatal clinic before 24 weeks.
- With premature rupture of membrane.
- With multiple gestation, previous LSCS, abnormal presentation.
- Planned caesarean section.
- Bad obstetrics history.
- History of cervical encirclage.
- High risk pregnancies with medical or obstetric comorbidities.

Study design

A prospective observational study conducted in 200 pregnant women. Informed consent was obtained from all patients. All pregnant women fulfilling the inclusion criteria attending Antenatal Clinic at 24-28 weeks of pregnancy and willing to participate in study were enrolled. Data was collected in a preconceived format. Information regarding details of demographic characteristics, presenting clinical symptoms and signs, parity, use of contraception, detailed obstetric history, including other morbidity (if any) was obtained. Relevant investigations were done for the same. All the patients were subjected to transvaginal ultrasound using 5 MHz transducer was used for Cervical length measurement in the department of Obstetrics & Gynaecology. All aseptic precautions were followed. All patients were followed up through their intrapartum period and obstetric outcome documented.

Statistical Analysis

Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups. The conclusions were drawn at 5% significance ($p < 0.05$) level.

RESULTS

Our study showed that the maximum number of cases studied was in the age group of 20 – 25 years. The mean age of patients was 27.28 ± 4.26 years (table 1). Maximum number of patients delivered at 37 – 40 weeks period of gestation (POG). POG is significantly associated with cervical length (mm) with $\chi^2=53.56$; $P<0.05^{**}$. However cervical length does not predict the success of Onset of labour and induction of labour. BMI is significantly associated with cervical length (mm) with $\chi^2=34.27$; $P<0.05^*$. Lower BMI is associated with shorter cervical length and hence is useful for predicting preterm labour in these patients (table 2).

Table 1: Correlation of age of patients with cervical length

Age in years	Number of patients (N=200)	Cervical length (mm)			
		25-30 (N=10)	31-35 (N=88)	36-40 (N=97)	41-45 (N=5)
<20	5	0(0%)	2(40%)	3(60%)	0(0%)
20-25	95	4(4.2%)	43(45.26%)	46(48.4%)	2(2.1%)

26-30	72	4(5.5%)	31(43.05%)	35(48.6%)	2(2.77%)
31-35	23	2(8.7%)	8(34.8%)	12(54.17%)	1(4.34%)
36-40	5	0(0%)	4(80%)	1(20%)	0(0%)

Table 2: Correlation of various parameters of patients with cervical length

Variables	Number of patients (N=200)	Cervical length (mm)				P value
		25-30 (N=10)	31-35 (N=88)	36-40 (N=97)	41-45 (N=5)	
POG at delivery (weeks)						
<37	14	4 (28.6%)	8 (57.1%)	2 (14.28%)	0 (0%)	<0.05*
37-40	144	5 (3.47%)	66 (45.8%)	69 (47.9%)	4 (2.8%)	
>40	42	1 (2.4%)	14 (33.3%)	26 (61.9%)	1 (2.4%)	
Onset of labour						
NA	4	0 (0%)	3 (75%)	1 (25%)	0 (0%)	>0.05
Induced	54	1 (1.85%)	22 (40.7%)	29 (53.7%)	2 (3.7%)	
Spontaneous	142	9 (6.3%)	63 (44.4%)	67 (47.2%)	3 (2.1%)	
Induction of labour						
Successful	50	1 (2%)	19 (38%)	28 (56%)	2 (4%)	>0.05
Failed Induction	4	0 (0%)	3 (75%)	1 (25%)	0 (0%)	
Correlation with BMI (Kg/m ²)						
18-22.9	45	5 (11.1%)	22 (48.9%)	17 (37.8%)	1 (2.22%)	<0.05*
23.0-30.0	110	5 (15%)	46 (41.8%)	57 (51.8%)	2 (1.8%)	
>30.0	45	0 (0%)	20 (44.4%)	23 (51.1%)	2 (4.44%)	

DISCUSSION

Preterm birth is the leading cause of perinatal morbidity and mortality. Despite advances in perinatal care, the incidence of preterm birth continues to rise, primarily because of the increased multiple pregnancies resulting from assisted reproduction. Tocolytics prolong pregnancy minimally once preterm labour has begun, and they can be associated with significant undesirable maternal, fetal, and neonatal consequences. In order to address the prematurity problem, it is important to identify those at increased risk. There are many risk factors for spontaneous preterm labour like multifetal gestation, uterine anomalies, chorioamnionitis, low socioeconomic status, illicit drug use. However, many women who deliver preterm do not have any known risk factors. Research has focused on combined risk scoring systems that use multiple serum markers, ultrasound, and maternal demographic factors, but these have not been fully validated in large scale studies. Other screening strategies that have been suggested include measuring biochemical markers such as fetal fibronectin and screening for infections.

Our study showed that the maximum number of cases were in the age group of 20 – 25 years and second gravidas and had a cervical length between 36 – 40 mm. Mean age was 27.28±4.26 years. Mean cervical length was 35± 2.67 mm which corresponds to the mean cervical length seen in general population.

This study shows that as cervical length decreases chances of preterm delivery increases. Similar trends were also seen in many other studies. (Iams JD et al. and Heath VCF et al).^[2,3]

Our study showed that there were 142 patients (71%) who went into spontaneous labour and 54 patients (27%) who were induced. 4 patients not allowed to enter into labour due to contraindications for vaginal delivery. In the present study it seen that with cervical length of 25 – 30mm only 1(1.85%) needed to be

induced. With a cervical length of 31-35mm and 36 - 40 mm the percentage of patients going into spontaneous labour was 44.4% and 47.2% and the percentage of patients induced was 40.7% and 53.7% respectively. But with cervical length of 41 – 45 mm percentage of patients going in spontaneous labour was 2.1% and induction was 3.7%. P value is not statically. Hence cervical length is not associated with onset of labour. From the present study it is seen that success of induction does not depend upon the length of the cervix. Studies done by Watson WJ et al.^[7] showed that sonographic evaluation of cervical length did not add significant independent information to success of induction of labour.

From the present study it is seen that with cervical length of 31- 35 mm all the postdated patients had successful induction. 95% of patients with cervical length of 36-40 mm went into spontaneous labour. None of the patients with cervical length between 41-45mm had failed induction. Hence there is no statistically significant results seen in patients with postdated pregnancy. Thus, cervical length does not predict the success of induction in postdated pregnancies. These were different from results observed in studies done by Brieger GM^[8] and Liu X, Yang J, Bian X.^[9] Our study showed that cervical length however is significantly associated with BMI. Lower BMI is associated with shorter cervical length and higher BMI is associated with longer cervical length. Similar results were R.S. Palma-Dias^[10] to examine the relation of cervical length at 22-24 weeks of gestation to demographic characteristics showed that shorter cervical length was observed in women with BMI less than 19.8.

CONCLUSION

We concluded that routine assessment of cervical length at 24-28 weeks of gestation is a good indicator of spontaneous preterm delivery.

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