International Journal of Biology, Pharmacy

and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

SINGLE CERVICAL LENGTH MEASUREMENT AT 36-38 WEEKS AS PREDICTOR OF SPONTANEOUS ONSET OF LABOR BEFORE 41 WEEKS

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ABSTRACT

To determine predictive role of CL measurement in women with third trimester pregnancy for spontaneous labor before 41 weeks.

Transvaginal sonography for CL (Cervical Length) measurement at gestational age between 36-38 weeks, was performed over 130 women by expert prenatologist and later followed up to delivery.

Data regarding maternal age, parity, BMI (Body mass index), sex of the fetus, birth weight, and time of delivery recorded.

Mean CL was 26.3 ± 5.9mm in nulliparous and 28 ± 6 mm in multiparous women (p=0.1). One hundred and eight women (83.07%) delivered before 41 weeks with mean CL 26 ± 5mm, while 22 women (16.9%) delivered after 41 weeks with mean CL 32.8 ± 6mm, (p<0.001), which indicates that the role of CL measurement as predictor of spontaneous onset of labor before 41 weeks, is statistically significant.

In this study mean CL measurement less than 28.2mm predicted spontaneous onset of labor before 41 weeks with sensitivity of 72% and specificity of 63% (AUC=0.78, p<0.001). Logistic

regression analysis shows that BMI and CL are two independent predictors of spontaneous onset of labor before 41 weeks.

CL measure in the third trimester may be used to estimate probable time of delivery. This seems to provide better consultation for women who are suspicious to have delivery after 41 weeks

Keywords: Cervical Length, Timing of Delivery

INTRODUCTION

Cervix examination by considering cervix as a marker of underlying pathologic process which could play role in preterm delivery has been considered for many years(17). Previously CL was measured by digital examination but studies showed that digital examination underestimates CL (17). CL could be measured by three methods: transabdominal (TAU), transperineal (TPU), also known as translabial and transvaginal ultrasound (TVU). TVU is the most precise method for measuring CL. For the first time, Andersen, et al recommended application of CL measurement by means of TUV to predict pre term delivery (18). In a previous systematic review, Romero et al found that short cervix is a risk factor for spontaneous pre term delivery (19).

Nowadays transvaginal sonography is widely used to evaluate CL. It is precise and effective method to predict spontaneous pre term delivery (2). CL has been considered in the second trimester broadly to predict pre term delivery ; shorter the cervix, higher the rate of pre term delivery(3). In recent five years, researchers evaluated CL in the first trimester of pregnancy and its predictive role for pre term delivery. Such as CL measurement in the second trimester, this measurement in the first trimester is predictive of pre term labor with lower sensitivity than this measure at the second trimester (4-8). But there are little studies regarding CL measurement in the third trimester to predict postdate deliveries(9). It should be considered that prolonged pregnancies could be complicated with fetal distress and perinatal and neonatal mortality along with maternal complications (10-12).

The goal of this study was to determine predictive role of CL measures in women with third trimester pregnancy to predict spontaneous onset of labor before 41 weeks.

MATERIALS AND METHODS

In this cohort study, 132 women with gestational age between 36-38 weeks were enrolled. The study conducted in Mirzakoochakkhan hospital (affiliated hospital of Tehran university of medical sciences) in 2014, (April to November).

Exclusion criteria were: previous cesarean section, medical history including diabetes and hypertension, twin pregnancies, IUGR (Intra uterine growth restriction), congenital anomalies, painful regular uterine contractions, or a history of ruptured membranes or cervical cerclage . All enrolled cases asked to fill informed consent forms.An expert prenatologist conducted transvaginal sonography to measure CL (Cervix Length) between 36-38 weeks of gestation and all patients followed up to delivery.

Data regarding maternal age, parity, BMI (Body mass index), sex of the fetus, birth weight, and time of delivery.

Data analyzed by means of SPSS version 20.

Data presented as mean ± SD and frequencies. P less than 0.05 considered significant.

RESULTS

130 women completed the study while 2 women lost during follow up. Table 1 shows demographic characteristics of patients.

Mean CL was 26.3±5.9 mm in nulliparous and 28±6 mm in multiparous women (p=0.1). One hundred and eight women (83.07%) delivered before 41 weeks while 22 (16.9%)

delivered after 41 weeks. Mean CL in women who delivered before 41 weeks was 26± 5 mm and it was 32.8±6 mm in women who delivered after 41 weeks,(p<0.001).

Mean CL was statistically higher in women who delivered after 41 weeks, (table 2).

The best point of CL to determine spontaneous onset of labor before 41 weeks is 28.2 mm for all cases with sensitivity and specificity of 72% and 63% (AUC=0.78, P<0.001) (figure 1).

The best point of CL to determine spontaneous onset of labor before 41 is 29.2 mm for multiparous cases with sensitivity and specificity of 77% and 70% (AUC=0.84, P=0.01).

The best point of CL to determine spontaneous onset of labor before 41 is 27.7 mm for nulltiparous cases with sensitivity and specificity of 76% and 61% (AUC=0.74, P=0.005).

Of 22 women who delivered after 41 weeks, 6 women had CL less than 28.2 mm whose mean BMI was 31.7

Logistic regression analysis shows that BMI and CL are two independent predictors of postdate delivery (table 3).

Table 1

	Mean ± SD/frequency
Age (year)	28±4.2
BMI(kg/m^2)	27.1±5.9
Parity Nulli-parous Multi-parous	 72(55.4%) 58(44.6%)
Fetus sex Male Female	 62(47.7%) 68(52.3%)
Birth weight(g)	3212±373

Table 2: mean CL in different groups.

	CL (cm)	P value
38th weeks	25.2±1.9	
39th weeks	25.4±5.6	
409th weeks	27.1±4.5	<0.001
41th weeks	28.4±4.8	
42th weeks	32.8±6.3	
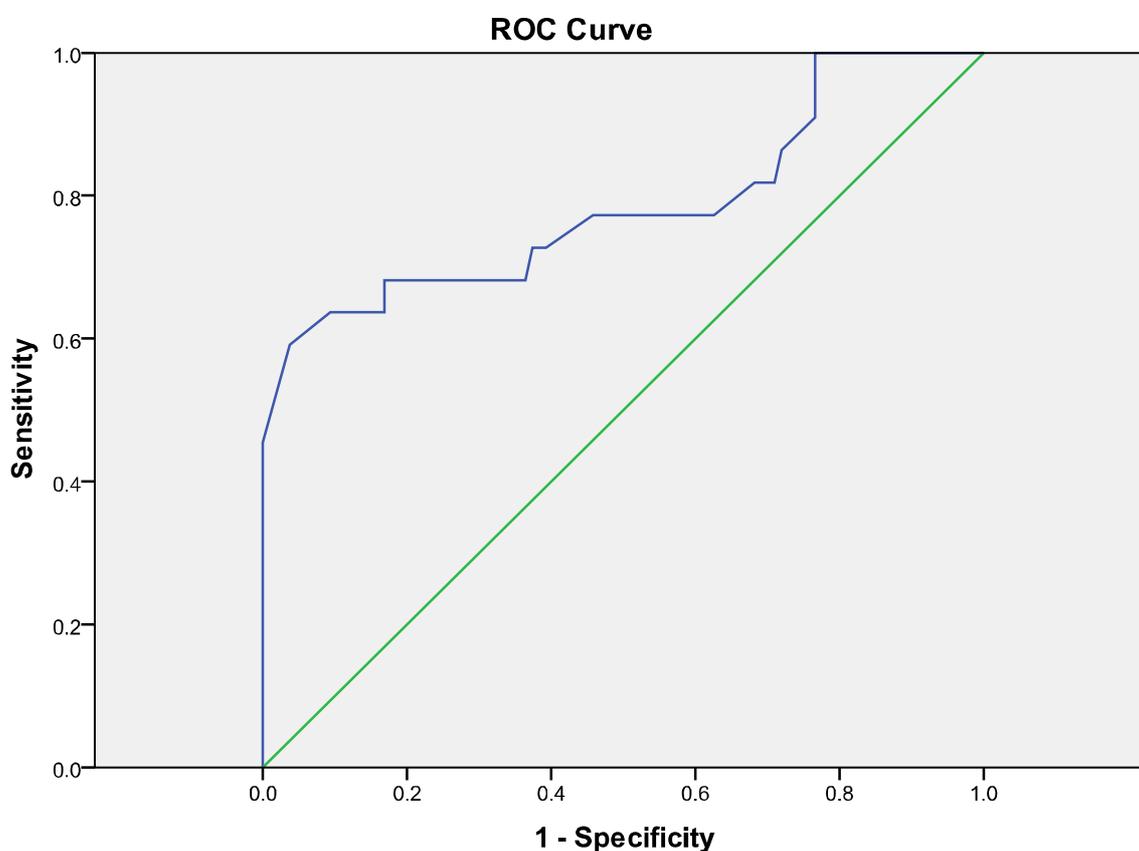
Diagonal segments are produced by ties.

Figure 1: ROC analysis to determine the best cut off point

Table 3: Logistic regression analysis

	OR	95%CI	P value
Parity	2.8	0.7-10	0.1
Age	0.9	0.8-1	0.2
BMI	1.3	1.1-1.6	0.001
CL	1.4	1.2-1.7	<0.001

DISCUSSION

The results of current study indicated that mean CL was statistically higher in women who delivered after 41 weeks than women who delivered before 41 weeks. We also found that CL and BMI were independent predictors of spontaneous onset of labor before 41 weeks. This finding represented that CL measurement between 36 and 38 weeks of gestation could be helpful to predict spontaneous onset of labor before 41 weeks. Souka et al evaluated 647 women with a singleton pregnancy between 24 and 40 weeks' gestation. They investigated that women with a short cervix had a higher probability for spontaneous delivery (hazard ratio: 1.8). like our findings, they reported lower delivery day in the subgroup with a short CL (13).

Strobel et al evaluated 97 women with gestational age of 291–296 days and measured CL. They found that in nulliparoous women CL could predict onset of labor ≤24 h and ≤48 h with sensitivity of 100% an 86% while in multiparous women the sensitivity of CL for predicting onset of labor ≤24 h and ≤48 h were 75% and 69%, respectively (9). In both nulliparous and multiparous women CL was a significant predictor of labor onset.

In another study, Ramanathan et al measured CL in 1571 women trans-vaginally at 37 week's of gestation and investigated median cervical length of 30 mm in all cases as well as no significant difference between nulliparous and multiparous women. Their findings showed that there was significant association between cervical length and gestation at delivery (r=0.73, p<0.001). The incidence of postdate delivery increased from 0% to 6%, 35% and 68% when CL increased from less than 20mm to 21-30mm, 31-40mm and 41-50 mm(14).

Tsoi et al examined 195 women in the third trimester who were high risk for pre term delivery and found that near half of cases with CL less than 15 mm delivered during following 7 days(15).

By means of ROC analysis we found that 28.2 mm is a good cut off point to predict spontaneous onset of labor before 41 weeks for all cases while this measurement was 29.2 mm for multiparous and 27.7 mm for nulliparous women. Rozenberg et al assessed Bishop Score and CL in 128 women with gestational age between 39 weeks and 4 days and 40 weeks and three days. They reported CL measure as 26 mm as a cut off value to predict delivery during following 7 days with sensitivity and specificity of 56.5% and 71.1%(16).

To apply in clinical investigation, 25mm had been considered as the cut off value. The length above 25mm, could be considered as normal and length less than 25 is indicative of short cervix(20-21).

In this study we concluded that CL measurement can be used to predict spontaneous onset of labor before 41 weeks. This may let us to provide better consultation for women who are suspicious to have prolonged pregnancy.

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