

## Study of Cervical Length Measurement by Transvaginal Sonography in Prediction of Mode of Delivery at Term

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### Original Research Article

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**Abstract:** To evaluate the predictive accuracy of transvaginal ultrasound cervical length measurement for prediction of mode of delivery at term. 140 singleton low risk primigravida with term gestation cephalic presentation were enrolled in the study. TVU CL at 37 weeks was measured. Women who went into spontaneous onset of labour were followed up till delivery. Women who did not go into spontaneous labour till 40<sup>+6</sup> weeks were induced with prostaglandins and progress of labour monitored. The primary outcome measured was mode of delivery delivery at term and its association with TVU CL at 37 weeks' gestation. Out of the total 140 patients enrolled in our study, 93 patients had TVU CL at 37 wks at or below 3 cm. Among these, 91 (97.84%) had vaginal deliveries and only 2 (2.16%) had caesarean sections. Whereas, 47 patients had TVU CL at 37 wks above 3 cm. Among them, 26 (55.32%) had vaginal deliveries and 21 (44.68%) had caesarean sections. According to outcome of the cases vaginal delivered cases were more compared to LSCS (97.84% v/s 2.16%) when cervical length at 37 wks is  $\leq 3$  cm. p-value was significant which was  $<0.05$ .

**Keywords:** Cervical Length Measurement, Transvaginal Sonography, Delivery

### INTRODUCTION

The ultimate goal of safe motherhood is accomplished in true sense when a healthy mother gives birth to a healthy baby at optimum time along with complete maternal and fetal wellbeing during pregnancy, labour and postnatal period. USG has been utilised in the antenatal armamentarium at different phases of gestation and is an integral part of antenatal care for accurate pregnancy dating and screening for fetal abnormalities, placenta previa and multiple pregnancy.

Over the past few years, cervical assessment has moved from digital examination to ultrasound evaluation and ultrasound of the cervix has been the focus of much research [1, 2]. Transvaginal ultrasonographic cervical measurement is quantitative, reproducible and easy to learn [3]. Transvaginal ultrasound allows visualization of the cervix beyond a closed external on and measures the cervical length accurately, without much inter-observers' variation, especially in cases of non-palpable cervix on digital examination. It may accurately reflect the cervical anatomy and it is considered a well-tolerated examination than painful pelvic examination

### METHODOLOGY

A longitudinal descriptive type of observational study was conducted at the department of Obstetrics & gynecology. 140 singleton low risk primigravida with term gestation cephalic presentation was enrolled in the study. TVU CL at 37 weeks was measured. Performed in the dorsal lithotomy position with empty bladder. The ultrasound probe was placed in the vagina proximal to the cervix (to avoid any cervical

distortion) of its position or shape and a sagittal view of the cervix, with the echogenic end cervical mucosa along the length of the canal, was obtained. Calipers were used to measure the distance between the internal and external os. Measurement in the absence of uterine contractions was recorded. Three consecutive cervical images were obtained and three separate readings of cervical length were taken and then the shortest cervical length was considered. Women who went into spontaneous onset of labour were followed up till delivery. Women who did not go into spontaneous labour till 40<sup>+6</sup> weeks were induced with prostaglandins and progress of labour monitored. Statistical analysis was done. Continuous variables were summarized as mean and Standard deviation while minimal/categorical variables as proportions. Unpaired t-test and other parameters were used for continuous variables where chi square and other non-parametric tests were used for nominal / categorical variables.

The primary outcome measured was mode of delivery at term and its association with TVU CL at 37 weeks' gestation.

**OBSERVATIONS AND RESULTS**

Mean age of cases was 24 ± 3.5 yrs. Most of the cases (81.43%) were Hindu and 17.86% were Muslim. Other (0.71%) being of other religion, which reflects the demographic profile of patients attending antenatal clinic. Majority of the women (71.43%) were from urban area and 28.57% were from rural area. Most of the cases (85%) belonged to middle socio-economic status, 15% were from lower and none belonged to upper socio-economic status. Majority of the cases (90%) were booked and 10% were unbooked. 10% cases were illiterate and rest were literate. The median cervical length in our study was 2.76 ± .58 cm whereas optimum cut off cervical length was 3 cm. Maximum number of cases (52.14%) were with CL 2-3 cm, 33.57% had CL more than 3 cm and 14.29% had CL in the range of 1-2 cm. None had CL less than 1 cm. In our study 47.14% of total cases enrolled went into spontaneous labour before 41 wks and rest i.e. 52.86% were induced with prostaglandins at or after 41 weeks' period of gestation. The incidence of vaginal delivery was 100% among the 66 (47.14%) cases that went into spontaneous labour. Among the 66 cases that went into spontaneous labour before 41 weeks' period of gestation, majority i.e. 65 had TVU CL at or below optimum cut off cervical length i.e. 3 cm and only 1 had TVU CL above 3 cm at 37 wks. Whereas among 74 cases which required induction at or after 41 weeks, majority (46) had TVU CL above 3 cm and only 28 had TVU CL at or below 3 cm at 37 wks. Among all the 66 cases that delivered vaginally after spontaneous onset of labour before 41 weeks' period of gestation, majority,

i.e. 65 had TVU CL at or below 3 cm at 37 wks whereas only 1 had TVU CL above 3 cm at 37 wks. Whereas among the 51 vaginal deliveries after induction of labour at or after 41 weeks' period of gestation, 26 had TVU CL at or below 3 cm at 37 wks and 25 had TVU CL above 3 cm at 37 wks. Thus a significant association (p < 0.001) was established between TVU CL and spontaneous vaginal delivery at 37 wks. Of all the cases induced in the study, 83.57% delivered vaginally and rest i.e. 16.43% underwent LSCS. Of all the cases delivered by LSCS i.e. 16.43%, most common indication for LSCS was failed induction accounting for 73.91% followed by fetal distress accounting for 26.09% of all the caesarean section done. Among the cases requiring induction, the incidence of caesarean section for failed induction or failure to progress increased from 0% to 5.88% to 94.12% for respective cervical lengths of 1-2 cm, 2-3 cm and >3 cm.

Out of the total 140 patients enrolled in our study, 93 patients had TVU CL at 37 wks at or below 3 cm. Among these, 91 (97.84%) had vaginal deliveries and only 2 (2.16%) had caesarean sections. Whereas, 47 patients had TVU CL at 37 wks above 3 cm. Among them, 26 (55.32%) had vaginal deliveries and 21 (44.68%) had caesarean sections. According to outcome of the cases vaginal delivered cases were more compared to LSCS (97.84% v/s 2.16%) when cervical length at 37 wks is ≤3 cm. p-value was significant which was <0.05.

**Table-1: Distribution of Cases According to Mode of Delivery**

Mode of Delivery	No.	%
Vaginal Delivery	117	83.57
LSCS	23	16.43
Total	140	100.00

**Table-2: Comparing TVS Findings with Mode of Delivery**

TVS Findings at 37 wks (Cervical Length)	Outcome							
	Vaginal Delivery (n = 117)		LSCS (n = 23)					
			Failed Induction (n = 17)		Fetal Distress (n = 6)		Total	
No.	%	No.	%	No.	%	No.	%	
≤3 cm (n = 93)	91 (Sp-65, In-26)	97.84 (Sp-69.88%, In-27.96%)	1	1.08	1	1.08	2	2.16
>3 cm (n = 47)	26 (Sp-1, In-25)	55.32 (Sp-2.13%, In-53.19%)	16	34.04	5	10.64	21	44.68

$\chi^2 = 41.13$        $p < 0.05$        $d.f. = 1$        $Sig$

**DISCUSSION**

Can I have a "normal vaginal delivery" is a question frequently asked by many pregnant females. Findings from present study demonstrate that measurement of cervical length at 37 wks can predict chances of spontaneous labour and delivery and thereby

help counselling women on need for obstetric intervention.. The incidence of caesarean section for failed induction also increased with cervical length at 37 wks. Vaginal delivery compared with LSCS was associated with a significantly shorter TVU CL at 37 wks.

Ibrahim A *et al.* [4] measured cervical length by TVS and it was significantly shorter in the patients delivered vaginally, compared with the patients delivered by caesarean section ( $24.7 \pm 6.9$ ) versus ( $26.5 \pm 8.2$ ) mm respectively.

Similarly in the study conducted by Gokturk U *et al.* [5] cervical length was statistically shorter in those delivered vaginally versus those delivered by caesarean section ( $23.1 \pm 7.42$  mm v/s  $31.3 \pm 6.83$  mm) respectively.

In the study conducted by Pereira S *et al.* [6] vaginal delivery occurred in 66.7% of cases and caesarean delivery was performed in 33.3% cases. There were significant correlation between cut off cervical length and mode of delivery with vaginal delivery occurring more with shorter cervical length than cut off point.

Hence these studied and the present study conclude that cervical length measured by TVS was significantly shorter in patients delivered vaginally compared with the patients delivered by LSCS.

Hence we can infer from our findings that routine measurement of cervical length at 37 wks. could identify a group at very high risk for prolonged pregnancy and subsequent emergency caesarean section. Such women may choose to have elective cesarean section at term.

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