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To Study Association of Cervical Length of Full Term Pregnant Women and Outcome of Labour

Sheetal K. Parmar[1], Nilam Prajapati[2], Anjani Shrivastava[3]

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Abstract

Introdution: Our aim was to determine the potential value of a routine ultrasound examination in low-risk pregnancies at 37 to 41 weeks for the prediction of likely outcome of labour, including the risk of prolonged pregnancy and the need for Caesarean section for failed induction or lack of progress in labour. *Aims and Objectives of the Study*: To assess cervical length in the subjects attending antenatal OPD with a singleton gestation with vertex presentation between 37 to 41 weeks and to study the likely outcome of labour. *Material and Methodology*: Women having gestational age of 37 to 41 weeks with cephalic presentation, intact membranes, live fetus and not labouring were included in the study. *Conclusion*: This study has demonstrated that measurement of CL at term can be used to determine the likelihood of prolonged pregnancy and the risk of emergency CS for failure to progress or failed induction of labour.

Keywords: CL- cervical length; FTND- Full term normal delivery; LSCS- Lower segment caesarean section; TVS- transvaginal sonography.

[1]3rd Year Resident [2]Assistant Professor [3]Associate Professor, Dept. of Obstetrics and Gynecology, Government Medical College, Surat, Gujarat 395001, India.

Corresponding Author:
Sheetal K. Parmar,
3rd Year Resident, Dept. of Obstetrics and Gynecology, Government Medical College, Surat, Gujarat 395001, India.

E-mail: sheetal.parmar10@gmail.com

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Introduction

During most of pregnancy, the cervix uteri is about 3.0 to 4.0 cm in length and closed. Toward the end of the period of gestation, progressive changes occur in the cervix, including softening, effacement (shortening), dilatation, and movement from a posterior to an anterior position in the vagina. The internal os starts to disappear as the cervical canal becomes part of the lower segment of the uterus. The extent to which these changes have taken place correlates with the proximity of the onset of labour and with the success of attempt to induce labour [1,2].

In the third trimester, ultrasound is used selectively in the diagnosis and management of problems suspected from clinical examination, such as fetal growth restriction, macrosomia, malpresentation and antepartum haemorrhage. Recent studies have reported that sonographic measurement of cervical length is a useful predictor of the likelihood of successful induction of labour [3-5].

Our aim was to determine the potential value of a routine ultrasound examination in low-risk pregnancies at 37 to 41 weeks for the prediction of likely outcome of labour, including the risk of prolonged pregnancy and the need for Caesarean section for failed induction or lack of

progress in labour. In the present study we report the findings of cervical length at 37 to 41 weeks and the relationship to the outcome of labour [6-8].

CL could be measured by three methods: transabdominal (TAU), transperineal (TPU), also known as translabial and transvaginal (TVU). TVU is the most precise method for measuring CL. For the first time, Anderson, et al recommended application of CL measurement by means of TVU to predict preterm delivery [9,10].

Transvaginal ultrasound (TVU) CL has been assessed in several populations (eg.-asymptomatic women as well as women with symptoms of preterm labour) andin women before induction of labour to predict induction outcome [11].

Many observational studies have evaluated the association between TVU CL at term and the interval to delivery. Although TVU is reproducible and easy to learn, studies demonstrate conflicting results regarding its predictive accuracy in this clinical scenario [12-15].

Aims and Objective of the Study

The objectives of this study undertaken were as follows:

- To assess cervical length in the subjects attending antenatal OPD with a singleton gestation with vertex presentation between 37 to 41 weeks.
- To study the outcome of labour.

Materials and Methodology

This observational prospective study was carried out during one year period from July 2017 to June 2018 at New Civil Hospital, Surat (tertiary care centre). The study subjects were selected from the antenatal OPD, from the women seeking delivery services at the department of Obstetrics and Gynecology at New Civil Hospital, Surat. 100 consenting subjects who fulfilled the inclusion criteria attending the antenatal OPD were included in the study. The eligible subjects were given participant information sheet and were enrolled in the study after obtaining written and informed consent to participate in the study. The study subjects were explained about the procedure to be performed. While measuring the cervical length transvaginally privacy of the subject was maintained. Subjects were asked to empty the bladder before the procedure. The subjects lie in a dorsal lithotomy position. Transvaginal cervical length was taken by a single observer. Three readings were taken. Average of these readings was taken.

The following *Inclusion Criteria* were used while selecting the subjects for the study:

1. Singleton pregnancy from 37 to 41 weeks of gestation
2. Cephalic presentation
3. Intact membranes
4. Live fetus
5. Non labouring

Consenting subjects who have completed 40 weeks were included in study only after assessment of modified biophysical profile was normal.

The following *Exclusion Criteria* were used for selecting the subjects for study:

a. Gestation age <37 weeks
b. Fetal malpresentation
c. Multifetal gestation
d. Premature rupture of membrane
e. Previous caesarean delivery
f. Congenital anomalies
g. IUFD
h. Painful regular uterine contractions
i. Antepartum haemorrhage
j. Pregnancy complications such as pre-eclampsia, intrauterine fetal growth restriction
k. History of cervical encirclage

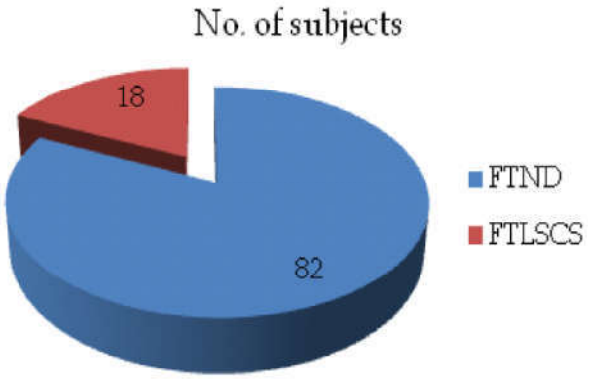
The subjects were asked to follow up in OPD of Obstetrics and Gynecology after 7 days for routine examination or to come to labour room if they had any complain like lower abdominal pain, leaking per vaginum or bleeding per vaginum. Subjects with complain of labour pain, leaking per vaginum or if they become postdate were admitted in labour room of New Civil Hospital, Surat. Labour monitoring and management were done as per protocol.

Observations, Discussion and Analysis

This prospective study was carried out in New Civil Hospital, Surat. 100 study subjects were included in the study. The observations were as followed.

Table 1: Outcome of Labour

Outcome of labour	No. of subjects
FTND	82
FTLSCS	18



Graph 1: Outcome of Labour

Table and Graph 1 shows mode of delivery in 100 subjects. The data shows that 82 subjects were delivered vaginally. 18 numbers of subjects were delivered by caesarean section. Maximum number of subjects delivered vaginally.

Table 2: Cervical Length ≤ 2.5 cm and Outcome of Labour

Cervical length ≤ 2.5 cm		Outcome of labour	
FTND		LSCS	
Spontaneous onset	54	47	07
Induced onset	10	10	00

In our study, there were 64 subjects with cervical length ≤ 2.5 cm. There were 54 subjects with spontaneous onset of labour. Out of these, 47 subjects had spontaneous delivery. 7 subjects underwent LSCS. 10 subjects required induction of labour and all of these delivered vaginally (Table 2).

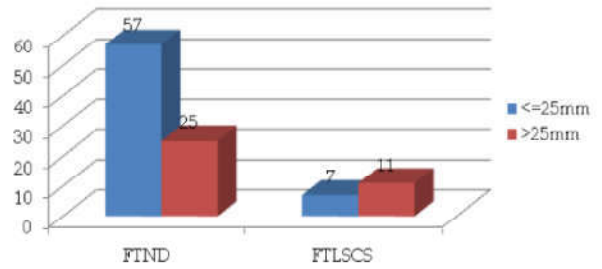
Table 3: Cervical Length > 2.5 cm and Outcomeof Labour

Cervical length > 2.5 cm		Outcome of labour	
FTND		LSCS	
Spontaneous onset	31	21	10
Induced onset	05	04	01

In our study 36 subjects had CL > 2.5 cm. 31 subjects had spontaneous onset of labour. Of these, 21 subjects had spontaneous delivery and 10 subjects underwent LSCS. 5 subjects had induced onset of labour. Of these, 4 had vaginal delivery and 1 underwent caesarean section for failure of induction (Table 3).

Table 4: Cervical Length and Outcome of Labour

Cervical length	FTND	FTLSCS
≤ 25 mm	57	07
>25 mm	25	11



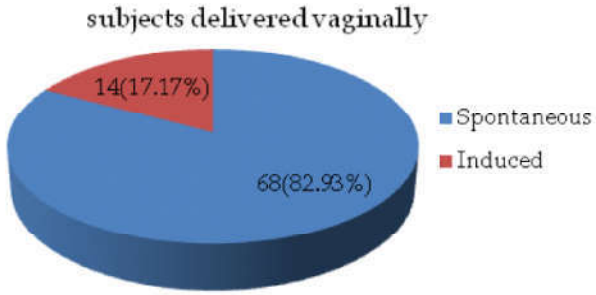
Graph 2: Cervical Length and Outcome of Labour

Table 4 and Graph 2 shows the outcome of delivery in subjects with CL ≤ 25 mm and CL > 25 mm. There were 64 subjects with CL </=2.50 cm, and 36 subjects with CL >25 mm. The data shows that when CL was ≤ 2.50 cm, 57 (89.06%) subjects had vaginal delivery, 7 (10.93%) subjects had caesarean section. When CL was >25 mm, 25 (69.44%) subjects had vaginal delivery and 11 (30.55%) subjects underwent caesarean section. Subjects with CL ≤ 2.5 cm have 89.06% chance of having vaginal delivery. From our study a 2 x 2 table is constructed. p = 0.014, which means it is statistically significant.

Table 5: Induced or Spontaneously Delivered

FTND	No. of Subjects
Spontaneous	68
Induced	14

Table 5 and Graph 3 shows the number of subjects delivered spontaneously and by labour induction. The data shows that out of 82 subjects delivered vaginally, 68 (82.93%) subjects delivered spontaneously and 14 (17.17%) subjects required induction of labour.



Graph 3: Induced or Spontaneously Delivered

Summary

In this prospective observational study, the association of cervical length and the outcome of labour were studied in the subjects between 37 to 41 weeks of pregnancy. In this study we assessed the outcome of labour in the subject studied.

In this study, 100 subjects fulfilling the inclusion criteria were taken. After taking informed consent, the TVS CL of these subjects was taken. These subjects were further followed up. In our study 82 subjects had vaginal delivery and 18 subjects underwent caesarean section. 89.06% of subjects with CL ≤ 2.5 cm delivered vaginally while 10.93% of subjects underwent caesarean section. When CL was >2.5 cm, 69.44% of subjects delivered vaginally. The outcome of delivery in form of vaginal delivery was more in subjects with CL ≤ 2.5 cm as compared to those subjects with CL >2.5 cm. The difference was statistically significant (p=0.014).

This study has demonstrated that CL identifies the women at high risk of prolonged pregnancy and can define the risk for failed induction or failure to progress in labour. This study has demonstrated an association between measurement of cervical length by transvaginal ultrasound and the likelihood of spontaneous onset of labour and outcome of labour.

Conclusions

CL by transvaginal ultrasound at term in singletons gestations, which is easily performed, could be used for prediction of spontaneous labour. It can be used to estimate the chance that a woman has a spontaneous delivery. Some women and their providers may benefit from knowing term TVU CL to make more accurate plans for birth.

This study has demonstrated that measurement of CL at term can be used to determine the likelihood of prolonged pregnancy and the risk of emergency CS for failure to progress or failed induction of labour.

In women with long TVU CL may sway the caregiver to induction, as the chance of timely spontaneous labour is low. Women with short TVU CL would be pushed to make last minute plans for welcoming the new born. Providers and birth locals may be able to better plan staff and coverage.

These data on TVU CL prediction of spontaneous labour may also be helpful for women choosing between planned LSCS and awaiting spontaneous onset of labour to attempt vaginal birth. This information can also allow caution to be taken regarding earlier, perhaps unnecessary, inductions if the TVU CL is long, i.e. unfavourable. It can enable better plans to be made regarding maternal transport. For pregnant women, this information may help them to arrange their social activities and deal with their anxiety. TVU CL as a screening test at term for prediction of spontaneous labour may be best considered in women who will benefit most from this test.

Strengths and Limitations

Strengths: One of the strengths of our study is the inclusion of study data on CL in prediction of spontaneous onset of labour in a specific population, i.e. singleton at term. The overall risk of bias of the included studies was low.

Limitations: Limitations of our study are inherent to the limitations of the included study subjects. The number of included women is limited. Our study did not compare the CL with digital examination or with Bishop's score. This study did not included the women with previous CS willing for VBAC, women having intrauterine growth retardation, women having IUFD.

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