



CERVICAL LENGTH A PREDICTOR OF PRETERM BIRTH

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ABSTRACT

BACKGROUND: Transvaginal ultrasound scanning (TVUSS) of cervical length at mid-gestation provides a useful method for predicting the likelihood of subsequent preterm birth. So, the present study was conducted to assess the cervical length as a predictor of preterm delivery.

METHODOLOGY: An Institute based Prospective Observational study was conducted among 100 singleton pregnant women at Kamineni Institute of Medical Sciences, Narketpally. Cervical length was assessed by TVS at 20-22 weeks gestational age. Data analysis was done using SPSS.

RESULTS: Mean age of the subjects studied was 26 years. The mean cervical length in the population studied was 3.47cm at 20-22 weeks gestation and in preterm and term it was 2.56cm and 3.68cm respectively and a significant difference found between mean cervical length and gestational age at delivery. Cervical length at cut-off value of ≤ 2.5 cm the sensitivity was 57.9% and at ≤ 3 cm the sensitivity increased from 57.9% to 73.6% for predicting preterm deliveries.

CONCLUSION: The evaluation of cervical measurements at 22-24 weeks by transvaginal ultrasound was good for identifying women at increased risk of preterm delivery.

KEYWORDS : Cervical Length, Preterm Delivery, Transvaginal Ultrasound Scanning.

INTRODUCTION:

Preterm birth is a major contributor to the global burden of disease and it is one of the leading cause of neonatal mortality worldwide and has effects on survivors that may be lifelong.¹ These include increased susceptibility to early severe infection, neurological impairment, psychiatric or behavioural issues and elevated risk of non-communicable diseases in adult life.² The ability to identify women who will deliver prematurely is important, as it allows targeted administration of effective treatments.

Comprehending the pathophysiology of spontaneous preterm birth will pave the way to precise methods of prediction and identify appropriate therapeutic targets for prevention. Spontaneous preterm birth was once thought to be due to the inability of the cervix to remain closed and maintain the pregnancy, from which arose the term 'cervical incompetence'. Now more commonly known as 'cervical insufficiency', this is a diagnosis applied in retrospect, in which progressive cervical shortening and painless dilation have resulted in recurrent mid-trimester pregnancy losses or preterm births, possibly preceded by prolapsing membranes or PPROM.^{3,4}

Transvaginal ultrasound scanning (TVUSS) of cervical length at mid-gestation provides a useful method for predicting the likelihood of subsequent preterm birth. In women who present with threatened spontaneous preterm labour, TVUSS of cervical length can help distinguish between true and false spontaneous preterm labour.⁵

Previous studies have also reported that transvaginal cervical length assessment may be a useful tool for prediction of preterm delivery. Many studies have found that cervical length at 20-22 weeks is a reliable predictor of preterm delivery.⁵ so, the present study was conducted to assess the cervical length as a predictor of preterm delivery.

OBJECTIVES:

1. To determine the distribution of cervical lengths in single

ton pregnancies at 22-24 weeks of gestation.

2. To examine the relationship between cervical length and preterm deliveries.

MATERIALS AND METHODS:

An institute based prospective observational study was conducted among singleton pregnant women at department of Obstetrics and Gynecology, Kamineni Institute of Medical Sciences, Narketpally, Nalgonda, Telangana. The study was carried out among 100 women who spontaneous delivery. A predesigned, pretested and semi structured questionnaire was used to collect the data. Multifetal pregnancy, Diabetes mellitus, Hypertension in pregnancy, Autoimmune disorders, Renal disease, Smokers and Congenital anomalies of uterus were excluded from the study.

Detailed history was taken and general and systemic examination was done. Per abdominal & per vaginal examination was done and findings were recorded. Basic Investigations like Complete blood picture, clotting time, bleeding time, blood grouping and Rh typing, GCT, HIV, HbsAg and complete urine examination were done. Cervical length was assessed by TVS at 20-22 weeks gestational age. Specifics of this sonographic evaluation based on the technique of Iams: the cervical length was measured along a closed endocervical canal, where minimal degrees of apparent dilation (i.e. echolucency along the entire canal) less than 5 mm were considered closed. Fundal pressure was also applied for 30 seconds by the sonologist as a provocative maneuver, and each scan included an evaluation period of at least 5 minutes to detect spontaneously occurring cervical shortening. The shortest cervical length for each examination that clearly displayed the internal and external cervical os with equivalent thickness of the anterior and posterior cervix was recorded as the cervical length, regardless of whether the measurement was obtained with pressure or was the result of spontaneous dynamic shortening. Data from the proformas was entered in MS-Excel 2013 and was analysed using SPSS version 23 software (trial version) and p-value less than 0.05

was considered as statistically significant.

RESULTS:

TABLE 1: PREGNANT WOMEN CHARACTERISTICS

		NO. OF PRETERM DELIVERIES	NO. OF TERM DELIVERIES
AGE	<25 yrs	13 (68.4%)	35 (43.2%)
	25-30 yrs	5 (26.3%)	38 (46.9%)
	>30 yrs	1 (5.3%)	8 (9.9%)
GRAVIDA	Primi	8 (42.1%)	22 (27.2%)
	Multi	11 (57.9%)	59 (72.8%)

TABLE 2: COMAPRING THE CERVICAL LENGTH AMONG PRETERM AND TERM DELIVERIES

	CERVICAL LENGTH		t = 9.846 & p = 0.000 (Sig.)
	MEAN	SD	
PRETERM (n = 19)	2.56	0.32	
TERM (n = 81)	3.68	0.47	

TABLE 3: COMAPRING THE CERVICAL LENGTH (at 20-22 weeks gestational age) AMONG PRETERM AND TERM DELIVERIES AT VARIOUS CUTOFF VALUES

CERVICAL LENGTH	NO. OF PRETERM DELIVERIES	NO. OF TERM DELIVERIES
≤ 2.5cm	11 (57.9%)	12 (14.8%)
>2.5cm	8 (42.1%)	69 (85.2%)
Total	19 (100%)	81 (100%)
Chi-square test = 15.48, d.f = 1, p-value = 0.000 (Sig.)		
Sensitivity=57.9%, Specificity=85.2%, PPV=47.8%, NPV=89.6%		
CERVICAL LENGTH	NO. OF PRETERM DELIVERIES	NO. OF TERM DELIVERIES
≤ 3 cm	14 (73.6%)	23 (28.4%)
> 3cm	5 (26.4%)	58 (71.6%)
Total	19 (100%)	81 (100%)
Chi-square test = 13.54, d.f = 1, p-value = 0.000 (Sig.)		
Sensitivity=73.6%, Specificity=71.6%, PPV=37.8%, NPV=92.1%		

TABLE-4: DISTRIBUTION OF FOETAL OUTCOME

FETAL OUTCOME	IN PRETERM	TERM
NICU ADMISSION	16 (84.2%)	11 (31.5%)
PERINATAL MORTALITY	4 (21%)	0
STILL BORN	2 (10.5%)	0

DISCUSSION:

In the present study majority of subjects belonged to the age group of <25 years, i.e. 48% followed by 25-30 years 43% which was similar to the study conducted by Wadhawan et al⁶. 70% of spontaneous vaginal deliveries occurred in multi gravida women. In preterm deliveries 57.9% were multigravida. Mean age of the subjects studied was 26 years. Minimum age in the study group was 18 years and maximum age was 34 years. The median maternal age for the women involved in a similar study by Wadhawan et al⁶ and M.H.B. Carvalho et al⁷.

In my study 81% delivered after 37 weeks of gestation, whereas preterm birth was seen in 19% which was slightly high when compared to Wadhawan et al.⁶ may be due to more number of multigravida in the study.

The mean cervical length in the population studied was 3.47cm at 20-22 weeks gestation and in preterm and term it was 2.56cm and 3.68cm respectively. There was a significant difference found between mean cervical length and gestational age at delivery. In a similar study by P.Arora et al⁸ mean cervical length was 3.2cm with minimum measurement of 2.1 cm and maximum

measurement of 4.4 cm. In similar studies by Hebbar S et al⁹ the mean cervical length was 3.5 cm.

In the present study, if the cut-off value of cervical length was taken at ≤ 2.5cm the sensitivity of test was 57.9% and Specificity was 85.2% and if we increase the cut-off value to ≤ 3 cm the sensitivity increased from 57.9% to 73.6% but the specificity decreased from 85.2% to 71.6% for predicting preterm delivery. So from the above findings ≤ 3 cm could be used a better predictor rather than ≤ 2.5cm for better sensitivity. Wadhawan et al. study had reported that with cut off value at 2.75 cm the sensitivity of test was 75% which was similar to the present study.⁶

Among the preterm babies 84.2% were admitted to NICU for various reasons whereas only 31.5% in term babies were admitted to NICU. Among preterm babies 21% babies had perinatal mortality.

CONCLUSION:

The evaluation of cervical measurements at 22–24 weeks by transvaginal ultrasound was good for identifying women at increased risk of preterm delivery when the cervix appeared short but for accurately determining the cut-off value for cervical length for predicting the preterm further studies was needed.

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