

First Trimester Cervical Length And Pre Term Birth

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Abstract: AIMS & OBJECTIVE: To assess the 1st trimester cervical length by Transvaginal USG as a predictor for spontaneous preterm birth. **MATERIALS & METHODS:** This cross sectional study was conducted from July 2012 to December 2012 in the antenatal clinic at PSGIMSR Hospitals. About 100 antenatal women who met the inclusion and exclusion criteria were enrolled in the study, the first trimester transvaginal ultrasonography was taken. These patients were followed up to determine gestational age at delivery. **RESULTS:** The data was entered into MS-Excel sheet and statistical analyses were performed using Statistical Package for Social Sciences (SPSS) version 19. All reported p-values are two-tailed, and confidence intervals were calculated at the 95% level. The data was presented using frequencies, percentages, descriptive statistics followed by charts, histogram and graphs.

CONCLUSION: Cervical length by first trimester transvaginal ultrasonography is not a predictor for spontaneous preterm birth.

KEYWORDS: first trimester ultrasound, cervical length, preterm birth

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I. Introduction

Preterm delivery (PTD) defined by World Health Organization as birth before the completion of 37 weeks' of gestation, is the leading cause of perinatal mortality and long-term morbidity [1-3]. The incidence of PTD in ranges from 5% to 18% in developing countries and 5 to 10 % in developed countries [4-8].

Preterm birth (PTB) is the main cause of neonatal death and neurological handicap in children [9-11]. Consequently prediction and prevention of this complication is a major challenge in pregnancy care. Evaluation of the cervix has been used as a tool to predict Preterm birth based on the concept that the cervix acts as an anatomic marker of the underlying pathologic process leading to preterm delivery. The cervical length has been measured using a digital examination in the past. Investigations using transvaginal ultrasound measurement as the standard confirmed that digital examination underestimates cervical length and the majority of studies found that ultrasound assessment of cervical length is superior to clinical examination for the prediction of PTB.[6]

Transabdominal ultrasonography has limitations for the measurement of the cervix because the fetal presenting part may obscure the cervix and the full bladder may cause a lengthened measurement of the cervical canal. Transvaginal sonography (TVS) is the imaging modality of choice for measuring length of the uterine cervix. TVS is simple, reproducible acceptable to patients and is inexpensive. It also provides high-quality images of the cervix, enables the assessment of the cervical length and funneling as defined as dilatation of the internal cervical os, when present, and has little or no risk of carrying vaginal micro organisms into the cervical canal as the probe is placed in the vaginal fornix.

In the literature there is evidence that the detection of a short cervix in the late second trimester by means of TVS is a strong predictor of PTD [12,13]. Nevertheless, the role of this method as a screening tool to predict PTD before 16 weeks' gestation is still controversial [4].

The purpose of our study was to determine whether there is a relationship between the first trimester cervical length which was measured between 11-14 weeks in a low risk patients with singleton pregnancies and the risk of spontaneous preterm birth.

II. Aim

To assess the 1st trimester cervical length by Transvaginal USG as a predictor for spontaneous preterm birth.

III. Inclusion And Exclusion Criteria

The inclusion criteria is all antenatal patients who attended the antenatal clinic between 11 to 14 weeks gestational age and the exclusion criteria is with previous history of preterm delivery, multiple pregnancy, history of cervical conisation and patients who underwent cervical encerclage.

IV. Materials & Methods

This cross sectional study was executed between the period of July 2012 – Dec 2012 at PSG IMSR Hospitals after obtaining ethical approval, who met the inclusion and exclusion criteria in about 100 patients. The transvaginal ultrasonographic examinations were performed between 11 to 14 weeks of gestation using Philips USG system with a 5MHz TVS probe. The antenatal women were asked to empty the bladder just before transvaginal USG examination and the transducer was placed in the anterior fornix without pressure to avoid any deformation or enlongation of the cervical canal. The entire length of the cervical canal is identified by the sonolucent endocervical mucosa and the callipers were used to measure the distance between internal and external os. These patients were followed up to determine the gestational age at delivery.

V. Results And Observations

The data was entered into MS-Excel sheet and statistical analyses were performed using Statistical Package for Social Sciences (SPSS) version 19. All reported p-values are two-tailed, and confidence intervals were calculated at the 95% level. The data was presented using frequencies, percentages, descriptive statistics followed by charts, histogram and graphs. Total number of antenatal women who underwent transvaginal ultrasonography between 11-14 weeks were 100.

TABLE 1 : MATERNAL DEMOGRAPHIC DATA AND PREGNANCY OUTCOME

CHARACTERISTICS	PRE TERM DELIVERY < 37 WEEKS (N=34)	DELIVERY ≥ 37 WEEKS (N=66)
Maternal age in years	25.00 (18-37)	26 (18-40)
Maternal weight in kilogram	57.15 (35-86.2)	52.35 (36.5-80)
Maternal height in centimeter	155 (138-169)	155.5 (143-172)
Gestational age	37 (28-37)	39 (38-40)

Table 1 describes the maternal demographic data and pregnancy outcome among the studied population into two groups < 37 weeks (34%) and term delivery ≥ 37 weeks (66%).

The mean ± SD GA at transvaginal ultrasound was 12 weeks ± 2 days (range, 11 +0 weeks to 14 + 1 week). The mean ± SD maternal age of the patients who underwent transvaginal ultrasound was 26.19 ± 4.3 years among which who delivered < 37 weeks is 26.29 ± 4.5 years (range 18 to 37 years), > 37 weeks is 26.14 ± 4.3 years, (range 18 to 40 years)

Figure 1 : Histogram

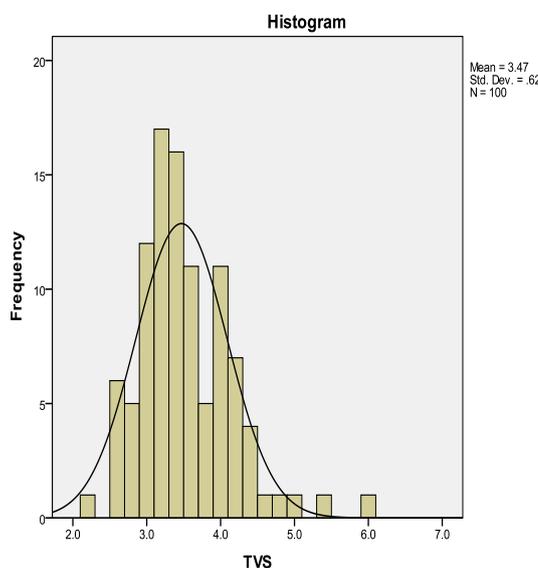


Figure 1 – Histogram shows normal distribution (solid line) and frequency distribution (bars) of cervical length at 11-14 weeks gestation [Mean ±SD,3.47±0.62; n=100]

TABLE 2 : TRANSVAGINAL CERVICAL LENGTH AND GESTATIONAL AGE AT DELIVERY

TVS CERVICAL LENGTH	GESTATIONAL AGE		Total
	≤ 37 WEEKS	≥ 37 WEEKS	
2.5 - 3.0 cm	12	12	24
	50.0%	50.0%	100.0%
>3 cm	22	54	76
	28.9%	71.1%	100.0%
Total	34	66	100
	34.0%	66.0%	100.0%

Table 2 shows the pregnancy outcome between the transvaginal cervical length and the gestational age at delivery which was statistically insignificant with P value of > 0.05
CHI-SQUARE TEST USING SPSS 19 ; P - >0.05, NOT SIGNIFICANT.

TABLE 3 : PARITY AND TRANS VAGINAL CERVICAL LENGTH

TVS CERVICAL LENGTH	PARITY		PARITY
	PRIMI GARVIDA	MULTI GARVIDA	
2.5 - 3.0 cm	17	7	24
	70.8%	29.2%	100.0%
>3 cm	54	22	76
	71.1%	28.9%	100.0%
Total	71	29	100
	71.0%	29.0%	100.0%

Table 3 shows the comparison between the parity and pregnancy outcome which is again statistically insignificant of P value 0.98.
CHI-SQUARE TEST USING SPSS 19 ; P - 0.98, NOT SIGNIFICANT.

VI. Discussion

Pre term birth prediction and management is one of the most challenging problems in modern obstetrics. Cervical incompetence accounts for not more than 2% of miscarriages or pre-term delivery. Many studies have shown that cervical changes seen by TVS are associated with increased risk of preterm birth and that the length of the cervix is directly correlated to the duration of pregnancy, the shorter the cervix, greater the likelihood of preterm delivery [14]. The mid trimester cervical length cutoff of 25mm is a good predictor of preterm delivery [4,14,15]. Moreover, patients with midtrimester cervical length of less than or equal to 15mm had 48% (19) and 52% (40) risk of early preterm birth (less than or equal to 32 weeks of gestation).

Naim et al in his study said TVS cervical length <3 cm before 16 weeks concluded that short cervix was associated with 23% risk of preterm delivery [16]. In our study although the risk for preterm delivery TVS cervical length <3cm was 35% (12), only 5.9% (2) of patients went into spontaneous preterm delivery, the remaining 23.5% (8) had premature rupture of membranes and 5.9% (2) had severe preeclampsia.

Hassan et al demonstrated that a mean cervical length of 37.5mm at 14 weeks of gestation was a weak predictor of preterm delivery than seen later in the midtrimester [17]. In our study the mean cervical length is 34.7mm between 11 to 14 weeks as shown in figure 1 histogram and found to be a weak predictor of preterm birth.

Hasegawa et al and Zorzoli et al found that there is no correlation between first trimester transvaginal cervical length and gestational age at delivery [18,19]. In our study out of 24 patient transvaginal cervical length between 2.5 to 3 cm and more than 3cm were 12 each who delivered at less than 37 weeks and more than 37 weeks GA, which is statistically insignificant, and we found that there is weak correlation between first trimester cervical length and gestational age at delivery.

Conoscenti et al in his prospective study performed TVS cervical assessment at 14 weeks of gestation as a screening test and concluded that it is not a predictor for pre-term delivery [20]. In our study also we found that first trimester cervical length by transvaginal ultrasound is not a predictor for preterm delivery.

VII. Conclusion

The first trimester cervical length by transvaginal ultrasonography is not a good predictor for spontaneous preterm birth.

ETHICAL CLEARANCE OBTAINED.

CONFLICT OF INTEREST: NONE

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