



RESEARCH ARTICLE

“MIDTRIMESTER SONOGRAPHIC CERVICAL LENGTH MEASUREMENT IN PREDICTION OF PRETERM BIRTH”

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Abstract

Background: Spontaneous preterm delivery, main source of perinatal morbidity and mortality. Forecasting high-probability category for premature delivery, primarily at 34 weeks, and timely management to avert this gestational problem have thus been health-care challenge. Cervical length estimated by TVS foresee premature delivery in asymptomatic low-probability women.

Methods: Prospective observational study conducted on 100 asymptomatic pregnant women who met inclusion and exclusion criteria were chosen at random. Using ultrasonography, cervical length is measured and they were followed-up after 3-4 weeks and till delivery and their gestation age at delivery, mode of delivery, birth weight of baby, NICU admissions were noted.

Results: In Present study, about 47% had cervical length equal to or less than 2.5 cm. About 53% had more than 2.5 cm cervical length and about 35% of the mother delivered Preterm less than 37 weeks of gestational age & about 65% of the mother delivered at and more than 37 weeks of gestational age. Hence Cervical length estimation by transvaginal sonogram has a genuinely precise sensitivity and specificity in expectation of premature delivery.

Conclusions: Preterm birth has a remarkable impact on perinatal mortality and morbidity. The use of TVS to determine the cervical length has the potential to help forecast the probability of preterm labor. Cervical length estimation at 18 to 24 weeks as standard screening strategy is practical and has great legitimacy as a successful screening test, and should be offered to all pregnant women.

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Introduction:-

Spontaneous preterm delivery, a composite perinatal and obstetric condition is the main source of perinatal morbidity and mortality. Regardless of latest management of neonates in the last centuries, couple of trials recognized high-probability category who might have premature delivery and also concentrate on perinatal results, yet premature delivery not decreased^[1]. Early labour is identified by symptoms such as spontaneous preterm labour, PPRM and recommended delivery in view of fetal or maternal reasons. Similar to how different mechanisms might cause parturition at term, several factors cause preterm labour Asymptomatic bacteriuria, cervical incompetence, cervico-vaginal infections, uterine overdistension, uteroplacental insufficiency, decidual hemorrhage and other factors might cause them. The gestational age at birth is major factor in preterm neonatal death with rates

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ranging from 44.2 percent for those delivered at 23 weeks to 4.4 percent for those born at 34 weeks⁶. Early detection of premature labour has been pursued as a means of reducing prematurity-related perinatal morbidity. Forecasting at 34 weeks, and timely management to avert preterm delivery have thus been key health-care challenges. Length of cervix estimated by TVS foresee premature delivery in asymptomatic low-possibility women in addition to those who are experiencing impending preterm labor^[1,2]. Interventional studies in singleton gestations suggest that assessment of cervical length, unlike fetal fibronectin testing, improves diagnostic accuracy and leads to better perinatal outcomes^[3].

The aim of the study is to study the role of routine mid trimester cervical length estimation as an indicator of preterm labor.

Methods:-

Prospective observational study conducted on Women attending OPD at Narayana Medical College and Hospital, Nellore.

Inclusion Criteria

1. Pregnants between 18-22weeks of gestation.
2. Booked in our hospital before 16 weeks of gestation with known LMP.
3. Patients who are willing to give consent for study
4. Singleton
5. Intact membranes

Exclusion Criteria:

1. Multifetal gestation
2. Congenital Fetal anomaly
3. Presence of uterine malformation and leiomyoma
4. Presence of maternal and fetal compromise such as Gestational hypertension, Gestational diabetesmellitus, Anaemia, Severe cardiac disease, Intrauterine death etc
5. Vaginal bleeding
6. Low lying placenta
7. Hydramnios
8. Patient in active labor, ruptured membranes
9. Who underwent permanent cervical shortening/surgery
10. Iatrogenic preterm birth due to severe preeclampsia, intrauterine fetal growth restriction etc
11. Patients who did not come for follow up

After explaining study details with informed consent patients meeting inclusion criteria are included in study. Using ultrasonography, CL is measured and are asked to come for follow-up after 3-4 weeks. These patients are followed up till delivery and their gestation age at delivery, mode of delivery are noted⁵. TVS of cervix is reference standard technique for accurate determination of dimensions and characteristics of the cervix.

USG Machine - Mind Ray 2D Ultrasound with Transvaginal probe (Frequency - 7.5MHZ).

Position - Dorsal supine position with hips abducted and sonographer introduces transvaginal probe that is covered by lubricated condom. Cervix Sagittal image occupying almost 50-75% of screen is taken and the transducer is withdrawn. Cervix length measured between internal os to external os. If cervix is not straight, two end to end straight measurements are taken and average cervical length measured^[4].

Three measurements are taken for three minutes and shortest measurement is noted as final cervical length. In each case, the following protocol is followed^[5].

1. History of the patient including menstrual cycle regularity, last menstrual period, availability of dating scan.
2. High risk factors for preterm labor defined previously like previous preterm delivery, spontaneous second-trimester abortion, threatened miscarriage in current pregnancy are noted.
3. History of past medical or surgical history like conization, D&C noted.
4. Basic blood investigations like Hemoglobin, urine routine, Blood grouping&typing, Viral screening, GCT done.
5. General and obstetric examination of every patient.

6. Cervical length measured between 18 – 22 weeks and are asked to come for a repeat scan after 4 weeks.
7. Patients are advised about preterm labor symptoms like dull lower abdomen crampy pain, discharge per vaginum etc.

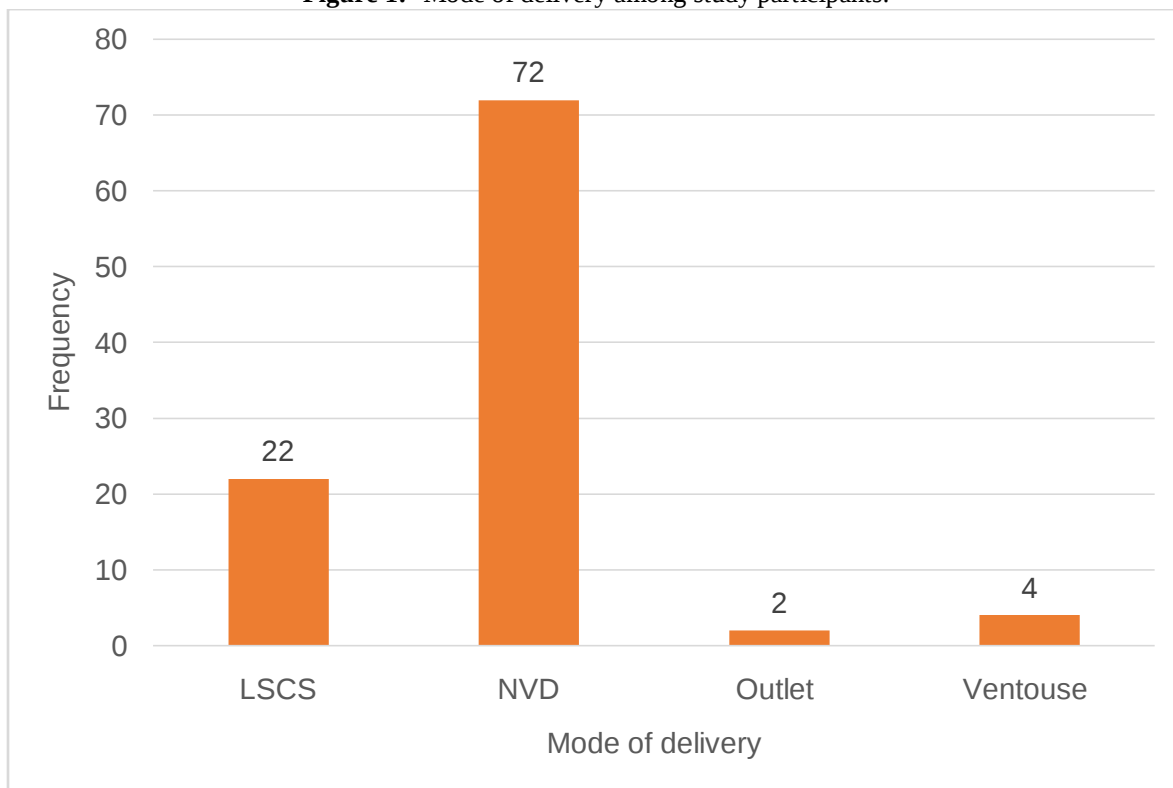
The study participants Gestational age at delivery, mode of delivery, birth weight of baby, NICU admissions were also followed up till delivery.

Results:-

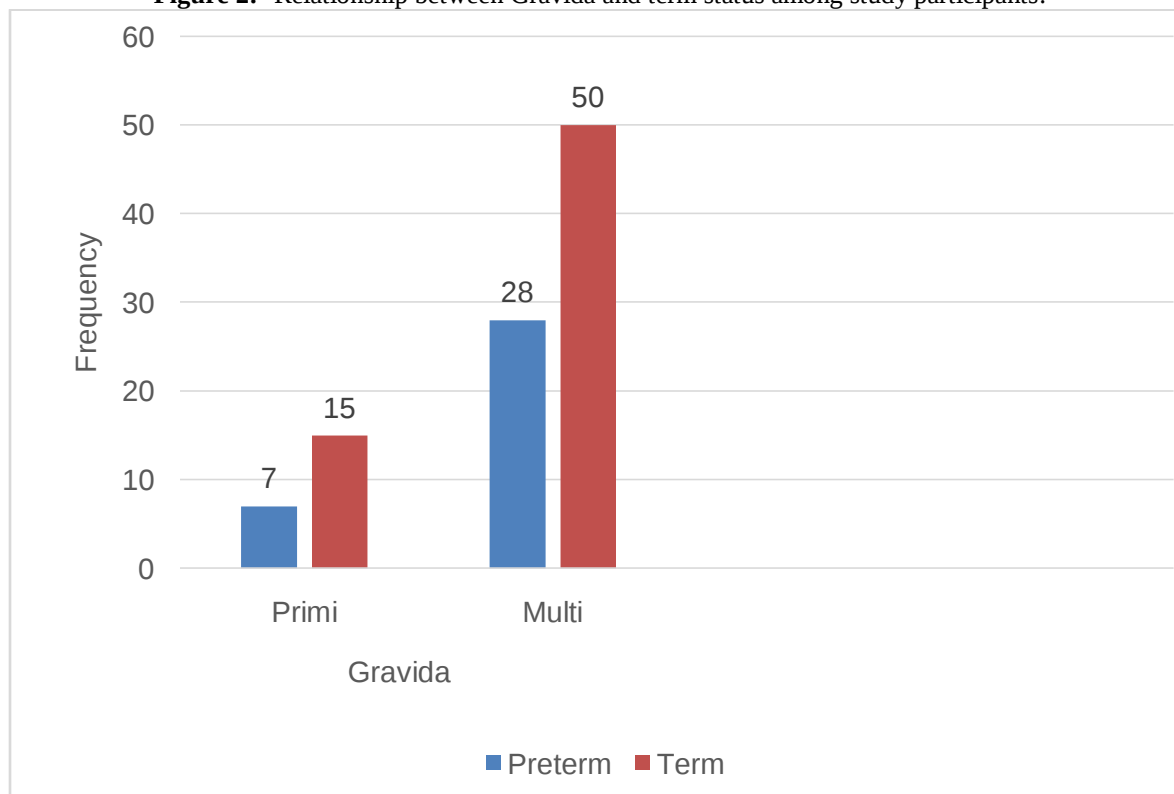
Data will be entered in Microsoft – Excel sheet. Percentage of the prevalence are calculated

In the present study, about 53% were in the age group of 21 to 25 years. About 32% were in the age group of less than 20 years. About 13% were in the age group of 26 to 30 years. Only 2% were in the age group of more than 30 years. Mean age is 23.68 and standard deviation is 5.68

Figure 1:- Mode of delivery among study participants.



About 72% were Normal vaginal deliveries. About 22% were LSCS of which 3 have cervical length less than 25mm and 2 have a cervical length of 25mm deliveries (fig 1).

Figure 2:- Relationship between Gravida and term status among study participants.

In the present study 23% were Gravida 2, 22% were Primi, 21% were Gravida 3, 17% were Gravida 4, 11% were Gravida 5 and 6% were Gravida 6. Among 100 patients examined, 22 patients were PRIMI of them 7 (31.8%) delivered before 37 weeks of which CL < 2.5 cm in 3 and 15 (68.18%) delivered at term; 78 patients were MULTI of them 28 (35.89%) delivered before 37 weeks of which 15 have CL < 2.5 cm and 50 (64.11%) delivered at term (fig 2).

Table 1:- Relationship between birth weight and cervical length among neonates of study participants.

Cervical length	Mean birth weight	S.D	P value
≤2.5 cm	2.17	0.31	0.001
>2.5 cm	2.95	0.51	

Mean birth weight found in mothers equal to or less than 2.5 cm is 2.17 and mean birth weight of mothers of group more than 2.5 cm is 2.95. Cervical length and birth weight among neonates of study participants have a notable statistical relationship ($P=0.001$) (table 1).

Table 2:- Relationship between term status and cervical length among study participants.

Cervical length	Preterm	Term	Total	Chi-square value	P value
≤2.5 cm	25	22	47	$\chi^2 = 12.90$	$P=0.00$
>2.5 cm	10	43	53		
Total	35	65	100		

About 35% of the mother delivered Preterm, less than 37 weeks of gestational age. About 65% of the mother delivered at and more than 37 weeks of gestational age.

About 47% had cervical length equal to or less than 2.5 cm. About 53% had more than 2.5 cm cervical length (table 2).

Those with CL less or equal to 2.5 cm were more at risk of delivering preterm babies compared to mothers who had more than 2.5 cm cervical length. In present study 25 (53.19%) of those with CL less than or equal to 2.5 cm delivered preterm and 22 (46.80%) delivered at term. P value is 0.00 which is statistically significant.

Table 3:- Relationship between NICU admission of neonates and cervical length among study participants.

Cervical length	NICU admission		Chi square	P value
	YES	NO		
≤2.5 cm	25	22		
>2.5 cm	2	51	30.86	0.0001
Total	27	73		

Babies born to mother having cervical length equal to or less than 2.5 cm are more at risk of getting admitted under NICU. Cervical length of mother and NICU admission of their neonates have a notable statistical relationship ($P=0.0001$) (table3).

Discussion:-

Present study is hospital based prospective observational longitudinal study in 100 Antenatal women. Preventing preterm delivery is considered main challenge in 21st century.

TVS of Cervical length estimation is good predictor of high and low-risk women for early labour. TVS may be used as reliable and cost-effective screening procedure in both low and high-risk asymptomatic patients between 18-22 weeks^[6,7]. Many studies have proved contribution of CL assessment by ultrasonography in estimation of preterm labor^[7]. CL<25mm at 24 weeks is more recognized with good sensitivity and confirms these findings^[8].

Fuchs et al studied impression of maternal age on early birth and noted that maternal age of 30 – 34 years was associated with lowest risk of prematurity.^[9]

There is independent association between nulliparity and spontaneous preterm birth. Besides, there is an increased sPTB in women in their fifth pregnancy, with maximum risk at early gestational age.

It would be practical to do serial CL estimation from 16–24 weeks' for mothers who had prior pre-term birth

In present study about 35% of asymptomatic singleton mother with CL less than 25mm, has delivered less than 37 weeks of gestation.

The CL found to be substantially small in vaginally delivered patients than LSCS. The method of birth and gestational age at which delivery was successful were forecasted using antenatal cervical length evaluation.

In the present study, when compared to mothers with cervical lengths greater than 2.5 cm, those with CL ≤2.5 cm had higher chance of delivering premature babies. Mean birth weight in group of mothers equal to or less than 2.5 cm is 2.17 and in women with CL>2.5 cm is 2.95, about 27% of neonates were admitted in NICU. Babies born to mother having cervical length equal to or less than 2.5 cm are more at risk of getting admitted to NICU.

Conclusion:-

Compared to the use of a cervical length <25 mm, a customized cervical length assessment

(1) identifies more women at risk of spontaneous preterm birth

(2) improves the distinction between patients at risk for impending preterm birth in those who have an episode of preterm labor.

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