A Study on role of Transvaginal Ultrasonography in Antenatal women with risk for Preterm labor in tertiary care hospital

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Abstract

Background: Preterm birth is the leading cause of perinatal morbidity and mortality worldwide.

The objectives of the present study were:1) the role of transvaginal ultrasonographyassessment of cervical length measurement, internal os diameter, funneling of internal os in predicting preterm labor among antenatal women with risk of preterm labor.2) neonatal outcome of the study population

Methods:A hospital based prospective study was carried out on 100 antenatal women attending antenatal OP and emergency room at risk of preterm labor over a period of 1 year from 2018-2019 and subjecting them to transvaginal ultrasound in assessing cervical length and cervical dilatation. The cases were then followed till delivery.

Results: Prediction of preterm labor with cervical length less than 25mm by transvaginal ultrasound was taken as a measure of diagnostic efficacy .Cervical length less than 25 mm had a sensitivity of 48.08% (34.01%- 62.37%), specificity of 91.67% (80.02% -97.68%), positive predictive value of 86.21% (70.11% - 94.3%) and negative predictive value of 61.97% (55.31% - 68.21%) in predicting preterm labor.

Conclusion: Transvaginal ultrasound is an efficient and reliable diagnostic tool to predict antenatal women with risk of preterm labor.

Key words: Preterm labor, cervical length, transvaginal ultrasound

Introduction

Preterm birth is the leading cause of perinatal morbidity and mortality worldwide. The incidence of preterm birth ranges from 5% to 18% in most developed and developing countries, but is still increasing worldwide.(1) The global rate of preterm birth as reported by World Health Organization (WHO) is around 10.6% of total live births, equating to an estimated 14.84 million live preterm births. India ranks first among the top 10 countries for increased number of preterm births with a proportion of 23.4% of global preterm births.(2) According to state disease burden profile, the proportion of premature deaths is around 64.4%.(3) . Preterm birth is associated with 75%neonatal deaths and 50% long term morbidity like Respiratory diseases and Neurodevelopmental impairment. (4) According to WHO, in 2010, 40% of all under five deaths (>3 million) occurred during the first month of

life. One thirds of these deaths were due to prematurity.

Globally, prematurity is the leading cause of death in children under the age of 5 years. At present in almost all countries with reliable data, preterm birth rates are increasing. In spite of major advances in obstetric and neonatal care, there has been no decrease in the incidence of preterm labor over half a century due to increasing rates of multiple births, greater use of assisted reproductive techniques, and increase in proportion of births among elderly women >35 years. Vigorous antepartum fetal surveillance and intervention in high risk pregnancies has reduced stillbirths but increased preterm births Many survivors face a lifetime disabilities, like learning disabilities, visual and hearing problems. Preterm birth carries significant social and economic burden which is estimated to cost 2.9 billion per year to the public sector..(5) It is therefore important that asymptomatic high risk women and symptomatic women in threatened preterm labor are identified early so that preventive interventions and management strategies can be taken to reduce the incidence of perinatal morbidity and mortality.

 As per WHO, Preterm labor is defined as the onset of labor prior to the completion of 37 weeks of gestation, in a pregnancy beyond 20 weeks of gestation.(6) Preterm labor is considered to be established, if regular uterine contractions can be documented at least four in 20 minutes or eight in 60 minutes with progressive change in the cervix in the form of effacement of 80% or more and cervical dilatation greater than 1cm. (7) If uterine contractions are perceived in the absence of cervical change, the condition is called threatened preterm labor.

The risk factors associated with pre-term labor include women less than 17years or greater than 35 years of age ; low BMI , overweight or obese women ; black women ; lack of regular antenatal care ; low socioeconomic status and multiple sexual partners resulting in STDs ; women living alone ; low literacy status (8) ; Obstetric complications like multiple pregnancies , Polyhydramnios , Preterm premature rupture of membranes (9) , Idiopathic preterm labor , Preeclampsia ,   Antepartum hemorrhage ,   2nd trimester bleeding not associated with placental cause , obstetric history like previous preterm or second trimester pregnancy loss (10) , Obstetric trauma ; cervical surgeries , D& C ; DES exposure ; Cervical incompetence ; infections like bacterial vaginosis , asymptomatic bacteriuria (11) ; psychosocial factors like Anxiety , Stress , Depression ;   negative life events , racial discrimination , Domestic violence ; Excessive alcohol intake , Smoking .(12)

Preterm labor can be physiological or pathological. The molecular basis of the initiation of labor is unclear but a number of theories have been proposed. Progesterone withdrawal, oxytocin stimulation, ascending infection and premature decidual activation are most common among them. Regardless of the stimulus the final pathway seems to converge towards a central role of inflammatory mediators i.e. Cytokines. (13). Hence a reduction in spontaneous preterm labor rate not only requires accurate identification of women at risks of preterm labor but also treatment strategies aimed at correcting underlying causes.

Methods for predicting preterm birth include patient demographics, Cervical length measurements, Fetal fibronectin test and Microbiological screening which improve diagnosis and allows early intervention and thereby leading to reduction in overall disease and economic burden .There are many risk scoring systems based on above factors for predicting preterm labor ,but their efficacy has not been proved by randomized controlled trials. Ultrasound measurement of cervical length is one of the predictors of preterm labor as it not only helps in predicting preterm labor in symptomatic women but also in asymptomatic high risk women.

Aim : The study aims to assess the role of short cervix in predicting preterm
        labor.
Objectives :1) The role of transvaginalultrasonographic assessment of cervical length measurement , internal os diameter ,funneling of internal os in predicting preterm labor among antenatal women with risk of preterm labor.
2) Neonatal outcome of the study population

Methods
The study was conducted after getting approval from Institutional Ethics Committee, S V Medical College, Tirupati with Lr No 83/2018 dated 28/09/2018.

A prospective study was carried out in Government Maternity Hospital , Tirupati , Andhra Pradesh over a period of 1 year on 100 antenatal women of any parity in their first or second trimester (14-28 weeks) attending antenatal OPD and emergency room with following risk factors whowere included in the study :
1) Occupation involving heavy manual work
2)History of previous oneor more preterm deliveries
3) History ofone or more miscarriages
4) History of any procedures on cervix like cryotherapy,cauterization, previouscervical tears, amputationof cervix
Exclusion factor:All antenatal women with chronic hypertension,pre-eclampsia, chronic renal disease, advanced preterm labor (80%cervical effacement ≥3cm cervical dilation), were excluded from the study.

 A detailed history was taken which included:
 1.age , education, occupation, marital status, socioeconomic status, residence and living conditions, personal history like diet, sleep, stress levels, negative life events, smoking, alcohol intake , family history like racial discrimination and domestics violence.
 2. A detailed obstetric history was taken regarding previous preterm births or 2nd trimester pregnancy loss, abortions, cervical surgeries, dilatation and evacuation, Obstetric trauma, history of cervical incompetence.
 3. Detailed general examination which included general condition, height, weight, BMI, thyroid,breast, spine, and gait. Vitals were recorded and systemic examination was done.
4. The antenatal women who met the inclusion criteria and those who met the diagnosis of

threatened preterm labor were subjected to transvaginal ultrasonography for cervical length, dilatation of internal os and presence of funneling.

Procedure of TVS: After explaining the procedure to the patient and obtaining verbal consent the procedure was started. Thewoman was asked to empty the bladder. The transvaginal probe was introduced into the vagina while monitoring the ultrasound image. The probe was guided gently into the anterior fornix. The urinary bladder's normal consistent position in the pelvis with relation to much variable position of uterus makes it a good landmark for initial assessment of the transducer orientation. Three basic scanning manoeuvers of the probe were useful to scan the pelvic organs comprehensively a) Sagittal imaging with side to side movements, b) 90° rotation to obtain semi-coronal images with angulation of probe in vertical plane, c) Variation in the depth of probe insertion to bring different parts within field of view/focal zone. A pelvic survey was done first to ascertain quickly the relative position of the uterus and ovaries as well as to identify any obvious masses. The image was enlarged so that the cervix occupied two thirds of the screen, ensuringthat both the internal and external os were seen clearly. The cervical length was measuredalong the endocervical canal between the internal and external os. The process was repeated twice to obtain 3 sets of measurement. The shortest measurementof cervical length was taken.

All women were subjected to routine investigations like Haemoglobin , blood sugar , total count , differential count , ESR , urine microscopy , urine culture and sensitivity.In case where cervical length was less than 25mm the patients were managed as per the hospital protocol and were followed till delivery

Analysis of demographic and baseline characteristics was done using percentage. Statistical analysis was done by applying Chi-square test, ANOVAs test to analyse the data. p value was determined. $P > 0.05$ is not significant $P < 0.05$ is significant $P < 0.001$ is highly significant

RESULTS
Table -1
SOCIO DEMOGRAPHIC FACTORS FOR PRE TERM LABOUR

Maternal age in years	Gestational Age at Delivery					
	Preterm (<37 weeks)		Term (>37 weeks)		Total	
	Number of cases	Percentage(%)	Number of cases	Percentage (%)	Number of cases	Percentage (%)
<20	16	30.8	13	27.1	29	29.0
20- 30	28	53.8	32	66.7	60	60
>30	08	15.4	03	6.2	11	11.0

Total	52	100	48	100	100	100
Socio economic status						
Low	48	92.3	43	89.6	91	91
Middle	4	7.7	5	10.4	09	9
Total	52	100	48	100	100	100
Education						
Illiterate	11	21.1	11	22.9	22	22.0
School	38	73.1	33	68.8	71	71.0
Graduation	03	5.8	4	8.3	7	7.0
Total	52	100.0	48	100	100	100
Occupation						
Sedentary	33	63.5	36	75.0	69	69.0
Moderate work	05	9.6	04	8.3	09	9.0
Heavy work	14	26.9	08	16.7	22	22.0
Total	52	100	48	100	100	100

In table 1 it was noticed that there was no statistically significant difference in terms of age,socioeconomic statusor literacy as risk factors for preterm labor. The only risk factor that was significant was heavy manual work.

Table 2: Antenatal Visits Distribution of Cases

Antenatal Visits	Gestational Age at Delivery					
	Preterm (< 37 weeks)		Term (>37 weeks)		Total	
	Number of cases	Percentage(%)	Number of cases	Percentage(%)	Number of cases	Percentage(%)
Booked	17	32.7	27	56.9	44	44.0
Unbooked	35	67.3	21	43.8	56	56.0
Total	52	100	48	100	100	100
Chi-square	X^2 Value = 5.622 df= 1; P=0.018 (significant at 0.05level) (p <0.05)					

56%women were unbooked. Majority of unbooked cases (67.3%) delivered preterm which is statistically significant with p-value < 0.05.

Table 3 Parity wise distribution of cases

Parity	Gestational Age at Delivery					
	Preterm (< 37 weeks)		Term (>37 weeks)		Total	
	Number of cases	Percentage(%)	Number of cases	Percentage(%)	Number of cases	Percentage(%)
Primigravida	13	25.0	20	41.7	33	33.0
Multigravida	39	75.0	28	58.3	67	67.0
Total	52	100	48	100	100	100
Chi-Square	X^2 Value = 8.247 df= 3; P=0.041 (significant at 0.05level) (p <0.05)					

Table -3 shows the parity wise distribution of the cases . 67% cases were multigravida of which 75 % delivered preterm . Multiparity had a linear correlation with incidence of preterm birth with a p-value of <0.05.

Table 4 Clinical presentation in Present Pregnancy

Risk factors	Gestational Age at Delivery					
	Preterm (< 37 weeks)		Term (>37 weeks)		Total	
	Number of cases	Percentage(%)	Number of cases	Percentage(%)	Number of cases	Percentage(%)
Threatened Preterm	30	57.7	35	72.9	65	65.0
Preterm Rupture of Membranes (PROM)	14	26.9	02	4.2	16	16.0
Threatened Abortion (2nd Trimester)	04	7.7	02	4.2	06	6.0
Urinary Tract Infections	03	5.8	04	8.3	07	7.0
Vaginal Discharge	1	1.9	05	10.4	06	6.0
Total	52	100	48	100	100	100

Chi-Square	X² Value = 10.133 df= 5; P=0.072 (Not significatnt at 0.05level) (p >0.05)

Table – 4 showed various clinical presentations in the present pregnancy.

Majority of the cases with complaints of threatened preterm delivered at term

(72.9%). The only risk factor which resulted in Preterm birth is PROM (26.9%) which is statistically significant with a p-value <0.05.

Table 5 Distribution of Risk Factors in Previous Pregnancy

Risk factors	Gestational Age at Delivery					
	Preterm (< 37 weeks)		Term (>37 weeks)		Total	
	Number of cases	Percentage(%)	Number of cases	Percentage(%)	Number of cases	Percentage(%)
One Miscarriage	08	15.4	28	58.3	36	36.0
> 1 Miscarriage	10	19.2	12	25.0	22	22.0
One Pretermbirth	14	26.9	05	10.4	19	19.0
>1 Preterm birth	18	34.6	01	2.1	19	19
Still birth	02	3.9	02	4.2	04	4.0
Total	52	100	48	100	100	100
Chi-Square	X² Value = 11.326 df= 5; P=0.045 (significatnt at 0.05level) (p <0.05)					

Table – 5 showed the risk factors of previous pregnancy.History of more than

one miscarriage (19.2%) and history of more than one preterm delivery

(34.6%) was significantly associated with preterm birth in present pregnancy with a p value < 0.05.

Table 6 Gestational Ageat Delivery

Birth		Gestational Age at Delivery in weeks	Number of Cases	Percentage(%)
Severe Preterm		28	05	9.6
		30	05	9.6
Moderate preterm		32-33	04	7.7

Late Preterm		34	12	23.1
		35	02	3.8
		36	24	46.2
Term		>37	48	48.0
Total			100	100

Table – 6 showed the weeks of gestations of Preterm births. Majority of the cases delivered at 34 -36 weeks of gestation (73.1%),

Table 7: Correlation between the Cervical Length & Gestational Age at Delivery

Cervical Length (cm)	Gestational Age at Delivery					
	Preterm (< 37 weeks)		Term (>37 weeks)		Total	
	Number of cases	Percentage(%)	Number of cases	Percentage(%)	Number of cases	Percentage(%)
>3.0	0	0	09	18.8	09	9.0
2.6 -3.0	27	51.9	35	72.9	62	62.0
2.1 -2.5	24	46.2	03	6.3	27	27.0
<2	01	1.9	01	2.1	02	2.0
Total	52	100	48	100	100	100
Mean Cervical length	2.61±0.24		2.86±0.24		2.73±0.27	
Chi-Square	X^2 Value = 26.248 df= 3; P=0.000 (significatnt at 0.01level) (p <0.001)					

Table 7 shows the cervical length (cms) measured by Transvaginal Ultrasonography and its relation to the Preterm and Term deliveries. 62%women had cervical length of 2.6-3.0 cms, of which 72.9% delivered at Term. 27 % of women had cervical length of2.1-2.5 cms, ofwhich 46.2 % delivered preterm which is statistically highly significant with p-value <0.001.

TABLE 8 Correlation between Cervical Length, Funnelingand Gestational Age at Delivery

Cervical Length(cm)	FUNNELING			
	Yes		No	
	Preterm	Term	Preterm	Term
>3.0	0 (0 %)	0 (0%)	0 (0 %)	9 (24.3 %)

2.6- 3.0	17 (43.6 %)	10 (90.9 %)	10 (76.9 %)	25 (67.6 %)
2.1 – 2.5	21 (53.8%)	1 (9.1%)	3 (23.1 %)	2 (5.4 %)
< 2.0	1 (2.6%)	0 (0 %)	0 (0 %)	1 (2.7 %)
Total	39 (100 %)	11 (100 %)	13 (100 %)	37 (100 %)
Chi-square	X² Value = 7.746 df= 2; P=0.021(significant at 0.05level) (p <0.05)		X² Value = 6.638 df= 2; P=0.084(Not significant) (p >0.001)	

Table – 8 shows the correlation between cervical length, funneling
Observed by TVS and the Gestational age at delivery.In women with cervical length> 3cm and no funneling none of them went into preterm labor. In women with cervical length between 2-2.9cm and presence of funneling incidence of preterm labor was 39 % which was statistically significant with p-value <0.05.

TABLE 9 Correlation Between Cervical Length, Internal OS and Gestational Age at Delivery

Cervical Length(cm)	Internal OS			
	Open		Closed	
	Preterm	Term	Preterm	Term
>3.0	0 (0 %)	0 (0%)	0 (0 %)	9 (20.9 %)
2.6- 3.0	1 (16.7 %)	4 (80.0 %)	26 (56.5 %)	31 (72.1 %)
2.1 – 2.5	4 (66.7%)	1 (21%)	20 (43.5 %)	2 (4.7 %)
< 2.0	1 (16.7%)	0 (0 %)	0 (0 %)	1 (2.3 %)
Total	6 (100 %)	5 (100 %)	46 (100 %)	43 (100 %)
Chi-square	X² Value = 4.547 df= 2; P=0.103(Not significant) (p >0.05)		X² Value = 25.093 df= 3; P=0.000(significant at 0.01 level) (p < 0.001)	

Table – 9 shows the correlation between cervical length, internal os
measured by TVS and the Gestational age at Delivery. 66.7 %women   with
cervical length 2.1-2.5 cms and open internal os delivered preterm whereas 43.5 % delivered preterm had cervical length 2.1 -2.5 cms but Closed internal Os.   Majority of women with cervical length 2.6-3.0 cms had term deliveries irrespective of internal OS status.

Table-10 : Diagnostic Efficacy of Cervical length measured by TVS

Cervical Length(cms)	Sensitivity	Specificity	Possitive Predictive value	Negative Predictive Value
2.5 cms	48.08% 34.01%-62.37%(95% CI)	91.67% 80.02%-97.68%(95%CI)	86.21% 70.11%-94.33%(95%CI)	61.97% 55.31%-68.21%(95%CI)

Table 11: Outcome Measures of the Study

Perinatal Outcome	Gestational Age at Delivery			
	Preterm (< 37 weeks)		Term (>37 weeks)	
	Number of cases	Percentage	Number of cases	Percentage
Still Birth	06	11.5	0	0
SNCU / NICU Admissions	41	78.8	8	16.7
Neonatal Deaths	07	13.5	1	2.1

Table 11 shows that 6 women (11.5%) who delivered preterm had still births and no still birth babies at term. 41 babies (78.8%) delivered preterm were admitted to SNCU/ NICU of which 7 (13.5%) neonatal deaths occurred whereas 8 babies (16.7%) delivered at term were admitted to SNCU/NICU of which 1 (2.1%) neonatal death occurred .

DISCUSSION

Preterm labor is a common condition and is associated with fetal complications early as well as later in life. It is associated with significant perinatal mortality and morbidity. The present study was a Hospital based Prospective study with an aim to predict the diagnostic role of transvaginal sonography in antenatal women with riskfactorsfor preterm labor. A total of 100 patients who met the inclusion criteria wereenrolled and followed up till delivery for the predictive value of cervical length and funneling of cervix in preterm labor and also perinataloutcome.

Sociodemographic Factors

In the present study 60% of women were in the age groupof 20- 30 years of which 53.8%delivered preterm. The mean age for preterm delivery was 24.52+/-5.1 years and for term delivery was 23.88+/-4.39 years.. A similar study in Iran showedmean age of women with term delivery is 26.09+/-4.13 years and thatof preterm is 26.7+/-3.71 (14).91% of total cases enrolled belonged to low socio-economic group and 9% belonged to middle socioeconomic group. The present study showed that socio-economic status proved to be statistically significant risk factor, but clinically this risk factor did not affect the gestational age at delivery The present study showed that the educational status of the antenatal women did not significantly effect the gestational age at delivery or the perinatal

outcome.26.9%women who did heavy manual work delivered preterm and 16.7%delivered at term.

Antenatal Visits

In the present study maximum number of cases who delivered preterm (67.3%) were un-booked. The number of booked cases whodelivered preterm were 32.7%, which is statistical significant with the P value < 0.05 and affected the perinatal outcome. According to study conducted in Bangladesh from June 2007 –September 2009,women who sought regular antenatal care (19.5%) and who have completed allbirth preparedness (18%) had a low risk of delivering preterm.(15)The present study is concurrent with the above study.

Parity

In the present study among the women who delivered preterm, 25% were primigravida,75% were multigravida . Hence,multi parity is a significant risk factor for preterm delivery with a p value of < 0.05. Study conducted in SMS Medical College, UttarPradesh, India, from January 2015 –December 2016 showed thatmaximum preterm deliveries occurred in the teenage group (27%) and elderly gravid (23.9%). Multiparity was an independent high risk factor and was found to be associated with 47.5% preterm births.(16).Another Indian study at Mahatma Gandhi Medical College and Research Institute , Pondicherry, showed that multigravida was a significant risk for preterm (62.5%) compared to primigravida (37.5%).(17)The present study correlates with the above studies .

Clinical Presentations in present pregnancy

In the present study, 57.7% women presented with complaints of

threatenedpreterm, 26.9% with premature rupture of membranes (PROM), 7.7% with threatened abortion, 5.8% with urinary tract infectionsand 1.9% with vaginaldischarge and delivered preterm . Rest of the women who presented with complaints of threatened preterm (72.9%), PROM (4.2%) , threatened abortions (4.2%) , urinary tract infections(8.3%) and vaginal discharge (10.4%) delivered at term .The significant risk factor among the presenting complaints was PROM. Among the16 women who presented with PROM, 14(87.5%) delivered preterm and 2 (12.5%) delivered at term which is statistically significant with a p value of <0.05. As per the study conducted in North India, the commonest risk factor associated with preterm was PPROM (26.6%).(16) In another North Indian study conducted from January 2005- August 2005, the incidence of preterm labor was 22%. PROM (25.9%) and infections (8.4%) were the commonest risk factors associated with preterm labour.(18).

Risk Factors in previous pregnancy

In the present study, previous history of more than one miscarriage (19.2%), preterm birth (61.5%) had preterm delivery, which was statistically significant with a p value of <0.05. As per Indian study conducted at SSG Hospital, Baroda,previous second trimester abortions (13.3%) and prior preterm birth (15%) in mothers were strongly associated with increased risk of preterm labour.(19)

Gestational age at delivery

In the present study. The mean gestational age of preterm delivery was 34± 1.25 weeks. 73.1% women delivered at 34 – 36 weeks, 7.7% at 32 - 33 weeks and 19.2% at 28 –30 weeks. The study done in Bangladesh, showed that among all the preterm births (22.3%) ,55.1 % delivered at 35 -36 weeks of gestation . (15) The present study correlates with the above studies.

Cervical and Gestational age at delivery

In the present study 9 women with cervical length > 3cm significantly delivered at term (18.8%). Of 52 women whodelivered preterm, 27 (51.9%) had cervical length of 2.6 –3cm, 24(46.2%) had a cervical length of 2.1 -2.5cm and 1 (1.9%) had a cervical length of <2cm. In our study the mean cervical length in preterm group was 2.61±0.24 cm and in term group 2.86 ± 0.24 cm. It was observed that women with cervical length of <2.5cm predominantly delivered preterm and cases with cervical length of >2.5cm delivered at term which is statistically significant with a p value < 0.001.In a South Indian study,spontaneous preterm delivery occurred in 13 (40.62%) women with cervical length <25mm. (17). In a prospective analysis study conducted at Mumbai, Indiain2015, 88 % women with cervical length of 2.5cms delivered preterm and only 12 %delivered at term (20).

Cervical length, Funneling and Gestational age at Delivery

In our study 27 women had funneling with cervical length 2.6-3.0 cm, of which 17 women (62.97%) delivered, preterm and 10 women (37.03%) delivered at term. 23 women had funneling with cervical length of < 2.5 cm, ofwhich 22 women (95.66 %) delivered; preterm and 1 women (4.34%) delivered at term.Presence of funneling was statistically significant risk factor in preterm delivery with a p value of <0.05. A study done in Mumbai, India, in 2015, was done to determine the efficacy of TVS ultrasonography evaluation of cervical biometry in predicting preterm delivery in asymptomatic low risk pregnant women at 22-24 weeks gestation. The results showed that 88women had preterm delivery, of which 36 women had funneling and only 2 of these could carry their pregnancies till term and 34 of them (94%) had preterm deliveries. (20)

Cervical length,Internal os and Gestational age at Delivery

In the present study, internalos was open in 5 women with cervical length greater than 2.5 cm and closed in 6 women. In women with cervical length less than 2.5 cm, internal os was open in 6 and closed in 23 of them. When the internal os was open, 6 women delivered preterm and 5 cases delivered at term. When the internal os was closed 46 women delivered preterm and 43

 delivered at term. Thus it was proved that an open internal os is not a significant predictive factor for preterm birth , but a closed internal os is proved to be have significance in predicting term delivery with a p value <0.001.

Diagnostic Efficacy of TVS

In the present study, a cutoff value of 25mm was taken to measure the diagnostic efficacy of cervical length as obtained by TVS. Sensitivity of 48.08% (68) (34.01%- 62.37%), specificity of 91.67% (80.02% -97.68%), positive predictive value of 86.21% (70.11% - 94.3%) and negative predictive value of 61.97%(55.31% - 68.21%) was observed. An observational cohort study was done in Yazd city, Iran in antenatal women between 21-24 weeks of gestation on screening of preterm labour by transvaginal ultrasound assessment of the length of cervix. The sensitivity and specificity of screening based on cervical length of 25mm were 55.5% and 93.6% respectively(14).A retrospective study done at Women's Health Centre of Eastern Health St. John's Newfoundland , Canada from April2003-March 2010 ,showed that in women with a history of spontaneous preterm birth , a cervical length less than 3cms measured by transvaginal ultrasonography had a sensitivity of 63.6%, specificity of 77.2%, positive predictive value of 28% and negative predictive value of 93.8% for preterm birth at less than 35 weeks.(21).A prospective study done at SMS medical college , Jaipur , Rajasthan from August 2015-July 2016 ,showed that prevalence of preterm labor was 27%, cervical length < 2.6cms had a positive predictive value of 52.10%, negative predictive value of 88.7%, sensitivity of 81.48% and specificity of 75.34% . The study concluded that transvaginal ultrasonography had a good sensitivity.(22).

Outcome Measures

In the present study among the women who delivered preterm, there were 6 still births (11.5%), 41 SNCU/NICU admissions (78.8%) and 7 neonatal deaths (13.5). There were no still births and only one neonatal death occurred among women who delivered at term. A study done at Mahatma Gandhi Institute of Medical science ,Wardha ,Maharashtra, India from 2013-2014 showed that babies born preterm had low birth weight and longer NICU admissions (40%).(23).

Conclusion

The present study showed that 52 % of antenatal women at risk of preterm labour delivered preterm and 48 % delivered at term. Previous preterm labor,2nd trimester miscarriages, PROM in present pregnancy were high risk factorsfor preterm labor in the present study. Cervical length <2.5 cms had a strong correlation for preterm labor. Transvaginal ultrasonography is a reliable,reproducible, cost effective tool to assess the cervical changes and to predict preterm labor in antenatal women at risk of preterm labor. This may help in assessing the outcome of pregnancy,counselling the women and planning appropriate interventions to prevent preterm birth and its associated neonatal complications, hence reducing neonatal morbidity and mortality.

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