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Correlation between uterine Wall Thickness Measured Via Trans-Abdominal Ultrasonography and Cervical Characteristics Measured Via Trans-Vaginal Ultrasonography and Prediction of Preterm Delivery

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ABSTRACT

Background: Preterm delivery (PTD) is a principal obstetric dilemma and also a population health threat. The PTD etiology is still a field of abundant research worldwide.

Aim of the work: To find the significance of ultrasonographically-estimated lower myometrium thickness along with cervical characteristics in the prediction of PTD.

Patients and methods: This study comprised 100 pregnant women (50 pregnant women who had risk factors of preterm labor and other 50 pregnant women without risk factors for preterm birth and with prior normal labor) during the period from March 2021 till the December 2021.

Results: Our results revealed that CL was shorter in cases who had risk of preterm labor (24.84± 3.19 mm) compared to that of those without risk (26.8±1.98 mm) (P <0.001). While, the cut off value of cervical length was 25.5(mm) for predicting risk of preterm labor, the sensitivity was 62%, specificity was 76%. The mean thickness of both lower anterior and mid anterior uterine wall was significantly thinner in women with risk of PTD than those without (5.42±0.49 (mm) vs. 5.88±0.36 (mm)), (P<0.001) & (5.45±0.49 (mm) vs. 5.89±0.37 (mm) respectively) (P<0.001). ROC curve showed that the optimum cut-off values for low anterior and mid anterior uterine wall thickness were 5.51 and 5.52 (mm) for predicting risk of PTD with sensitivity 58% of both markers.

Conclusion: Trans-abdominal ultrasound measurement of lower uterine segment thickness may represent an effective, precise, appropriate, and harmless procedure in anticipating the preterm labor with high validity than cervical length.

Keywords: *Preterm delivery; uterine wall; cervical length.*

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INTRODUCTION

Preterm delivery is a principal obstetric dilemma and also a population health threat. Preterm birth (PTB) difficulties are also a leading cause of death in children under the age of five. Paralleled to their term children counterparts, preterm babies have an extra risk of developing disabilities.[1]

Accurate and appropriate cervical status assessment has become critical in evaluating spontaneous labor start. With the widespread use of ultrasound in obstetric practice, investigators began examining changes in cervical morphology by sonographic scanning and promoting trans-vaginal ultrasonography (TVS) as a reliable method for assessing the cervix and lower uterine segment.[2]

Cervical shortening, when detected ultrasonographically between the 20th and 24th weeks of gestation, is a critical risk factor for developing PTD. This has been recognized in populations with various risk profiles, fluctuating from low-risk, single and asymptomatic gestations to high-risk pregnancies attributable to either a prior history of preterm birth or twin pregnancy.[3]

Due to the proximity of the lower uterine wall to the cervix, it has been reported that the alterations that began in the cervix may also affect the adjoining lower uterine wall. Using readily available trans-abdominal ultrasonography, the thickness of the lower uterine wall may be accurately measured in practically all clinical situations.[4]

There is inverse association among the lower uterine segment thickness in addition to cervical length and increasing gestational age as the lower segment converts to be thinner.[5]

The target of this study was to find the impact of ultrasonographically-estimated lower myometrium thickness along with cervical characteristics in the prediction of PTD.

PATIENTS AND METHODS

This study was a prospective cohort study that was done at El-Sayed Galal Hospital of Al-Azhar University and Sedy Salem Central Hospital on a total of 100 pregnant ladies who attended antenatal care visits during the period from March 2021 till December 2021.

Inclusion criteria were maternal age between 16 -40 years, gestational age between 20-24 weeks of gestation, singleton pregnancy, and viable feti. Primigravidae cases, cases with gestational age less than 20 weeks or those who were unsure about gestational age and those who had multiple gestations, cases with suspected IUGR, fetal macrosomia, accidental hemorrhage, polyhydramnios, and oligohydramnios have been left out of this study.

Participants in the study were split into 2 groups: Group A that included 50 pregnant women who had risk factors of preterm birth as: prior history of preterm birth with or without other risk factors and group B that included 50 pregnant women without risk factors for PTD and with prior normal labor.

The chosen patients had a complete history taking as well as a full general and abdominal examination besides laboratory investigations The ultrasound equipment used was (MINDRAY DC-N2, China) using a 3.5- 5-MHz trans-abdominal probe and 5-9 MHz trans-vaginal probe at the ultrasound unit of the Obstetrics and Gynecology department at El-Sayed Galal Hospital of Al-Azhar University and MINDRAY DC-N2, China at Sedy Salem Central Hospital.

Trans-abdominal ultrasound examination: was done at admission for assessment of gross anatomical defects, fetal viability, amniotic fluid index (AFI), fetal biometry and Myometrium thickness measurement.

Trans-vaginal scan: was done at admission for assessment of cervical length (CL) measurement:

Three measurements were taken, and the shortest measurement was documented. The cervical canal was equi-distant from the anterior to posterior cervical walls.

Anterior uterocervical angle (UCA) measurement.

Inner to inner cervical diameter was also measured for detecting the funneling width.

Then, the entire participants in risky group received prophylactic tocolytic drug in the form of progesterone 400 mg vaginal suppository (prontogest) once daily at night

Follow up:

All women were followed up by serial transabdominal ultrasound examinations to monitor AFI and fetus growth. If there was clinical indication of fetal distress as established by fetal heart monitoring, the incidence of intrauterine death, or reaching full term, delivery was recommended.

Mode of delivery was recorded. The perinatal outcomes were assessed for birth weight and gestational age at delivery.

Statistical analysis:

SPSS version 23 was used for statistical analysis. Shapiro –Wilks test was used to test normal distribution of variables. Numerical data were expressed as mean ± standard deviation or median and range. Categorical data were summarized as percentages. The importance for the change between groups was determined by using two-tailed Student's t test. Also Qualitative variables were assessed by chi-squared χ^2test. The probability (P) values of ≤0.05 were thought to be statistically important.

RESULTS

Groups Variable	Group(I) (n=50)	Group(II) (n=50)	P-value
Age(Yrs.)	25.98 ± 3.12	26.2 ± 4	0.760
BMI at enrollment	25.46±3.35	26.36±4.5	0.261
Gestational age at scan (weeks)	22.32±1.09	22.38±1.9	0.847
Gestational age at delivery (weeks)	35.7±1.76	37.88±1	<0.001**
Parity	1.36±1.08	1.08±1.09	0.2
Mode of delivery.			0.224
Vaginal	18(36%)	24(48%)	
Cesarean section	32(64%)	26(52%)	
Previous history of preterm pre labour rupture of membrane (PPROM)			0.249
No	41(82%)	45(90%)	
yes	9(18%)	5(10%)	
History of abortion			0.337
None	32(64%)	35(70%)	
1	12(24%)	13(26%)	
2	6(12%)	2(4%)	
Birth weight [g]	2666.5±310.2	3122.3±176.9	<0.001**
Neonatal outcome			
Neonatal Mortality	2(4%)	0(0%)	0.153
Neonatal Sepsis	2(4%)	0(0%)	0.153

Neonatal ICU more 2 weeks	7(14%)	2(4%)	0.081*
Respiratory distress syndrome (RDS)	9(18%)	5(10%)	0.249
Low anterior- Uterine thickness (mm)	5.42±0.49	5.88±0.36	<0.001**
Mid anterior Uterine thickness (mm)	5.45±0.49	5.89±0.37	<0.001**
Fundal thickness (mm)	5.48±0.47	5.9±0.37	<0.001**
Posterior uterine thickness (mm)	5.6±0.46	6.01±0.38	<0.001**
Cervical length (mm)	24.84± 3.19	28.8±1.98	<0.001**
Utero-cervical angle (UCA) (Degree)	106.53±30.01	98.33±18.6	0.06
Inner to inner cervical diameter (mm)	4.31±0.72	3.56±00.88	0.59

Values are expressed as mean ± standard deviation or n (%) unless otherwise specified;

BMI — body mass index

UCA-Utero-cervical angle

- *: P ≤0.05, **: P ≤0.01.

Table 1: Demographic data and ultrasound parameters of both studied groups:

Table1: indicated that the mean age was 25.98 ± 3.12 years in group (I) and 26.2 ± 4 years in group (II). There were no statistically notable change in the mean age of both studied groups (P=0.760). BMI was lower in cases who had risk factor of preterm labor (25.46±3.35 kg/m2) compared to that of cases without risk factors (26.36±4.5 kg/m2) (P =0.261), these results indicated that there was no statistically significant difference between all studied groups according to body mass index, and parity (P>0.05). It was observed that There were statistically significant decrease in gestational age at delivery in cases with risk factors for preterm labor (35.7±1.76 weeks) than those without risk factors for preterm birth (37.88±1 weeks) (P<0.001). Considering neonatal birth weight, it was detected that there was statistically significant difference between the both studied groups regarding mean birth weight as it was 3122.5±310.2 in women who had no risk of preterm labor compared to 2666.3±176.9 in women with risk of preterm labor; with P=value =0.001. The majority of babies had weight more than 2500 g. The current study showed that there was statistically significant difference between distribution of studied groups regarding neonatal birth weight (P <0.001). Our study showed the mean thickness of both lower anterior and mid anterior uterine wall was significantly thinner in women with risk of preterm labor than those without (5.42±0.49 (mm) vs. 5.88±0.36 (mm)), (P<0.001) & (5.45±0.49 (mm) vs. 5.89±0.37 (mm) respectively) (P<0.001). There was statistically significant difference between two studied groups regarding cervical length (P <0.001).

Parameters	Low anterior-Uterine thickness (mm)		Mid anterior Uterine thickness (mm)		Fundal thickness (mm)		Posterior uterine thickness (mm)		Cervical length (mm)	
	r	P-value	r	P-value	r	P-value	r	P-value	r	P-value
Preterm labour	-0.417**	<0.001	-0.389**	<0.001	-0.366**	<0.001	-0.373**	<0.001	0.249**	<0.001
Age (Years)	-0.089	0.380	-0.053	0.602	-0.048	0.634	-0.032	0.752	-0.072	0.475
BMI (Kg/m^2)	0.077	0.449	0.121	0.232	0.113	0.264	0.129	0.200	-0.01	0.925
Parity	-0.112	0.270	-0.074	0.464	-0.057	0.576	-0.027	0.787	0.046	0.650
Gestational age at scan (weeks)	0.072	0.478	0.041	0.683	0.026	0.798	0.039	0.701	0.176	0.079
Gestational age at delivery (weeks)	0.651**	<0.001	0.634**	<0.001	0.629**	<0.001	0.602**	0.001	0.672**	<0.001
Previous PPROM	-0.094	0.353	-0.062	0.541	-0.038	0.704	-0.052	0.604	0.028	0.785
history of abortion	0.023	0.820	0.061	0.550	0.031	0.759	0.05	0.623	-0.102	0.313
inter pregnancy intervals less than 18 months	-0.236*	0.019	-0.220*	0.028	-0.218*	0.029	-0.175	0.082	-0.157	0.118
Mode of delivery	0.043	0.675	0.041	0.685	0.015	0.884	0.046	0.647	0.09	0.375
Birth weight	0.601**	<0.001	0.598**	<0.001	0.573**	<0.001	0.550**	<0.001	0.545**	<0.001
Low anterior-Uterine thickness (mm)	1	-	0.981**	<0.001	0.974**	<0.001	0.953**	<0.001	0.497	0.155
Mid anterior Uterine thickness (mm)	0.981**	<0.001	1	-	0.990**	<0.001	0.968**	<0.001	0.464**	<0.001
Fundal thickness (mm)	0.974**	<0.001	0.990**	<0.001	1	-	0.974**	<0.001	0.441**	<0.001
Posterior uterine thickness (mm)	0.953**	0.00.	0.968**	<0.001	0.974**	<0.001	1	-	0.402**	<0.001

Cervical length (mm)	0.497**	0.155	0.464**	<0.001	0.441**	<0.001	0.402**	<0.001	1	-
Neonatal Mortality	-0.160	0.115	-0.173	0.085	-0.173	0.085	-0.092	0.365	-0.126	0.213
Neonatal Sepsis	-0.160	0.115	-0.173	0.085	-0.173	0.085	-0.092	0.365	-0.126	0.213
Neonatal ICU more 2 weeks	-0.187	0.064	-0.186	0.063	-0.212*	0.034	0.162	0.107	-0.293**	0.003
Respiratory distress syndrome (RDS)	-0.140	0.168	-0.141	0.162	-0.154	0.125	-0.085	0.398	-0.248*	0.013

Table 2: Correlation between uterine wall thickness, cervical length and other Parameters

Table2: was showed that there was statistically significant positive correlation between all uterine wall thickness as well as cervices length and gestational age at delivery (P<0.001), neonatal birth weight (P<0.001). Also, negative correlation was found between uterine wall thickness as well as cervices length and preterm labor (<0.001). In addition, all uterine wall thickness was negatively correlated with inter pregnancy intervals less than 18 months (P<0.05). Finally, statistically significant negative correlation was observed between cervices length and administration in neonatal ICU more 2 weeks (r=-0.293, P=0.003), and RDS (r=-0.248, P=0.013).

Parameters	Cutoff	AUROC	Sensitivity	Specificity	PPV	NPV	Accuracy
Low anterior- Uterine thickness (mm)	5.51	0.803	58%	90%	85.3%	68.2%	74%
Mid anterior Uterine thickness (mm)	5.52	0.772	58%	92%	87.9%	68.7%	75%
Fundal thickness (mm)	5.615	0.767	60%	88%	83.3%	68.8%	74%
Posterior uterine thickness (mm)	5.735	0.744	58%	86%	80.6%	67.2%	72%
Cervical length (mm)	25.5	0.708	62%	76%	72.1%	66.7%	69%

Table 3: ROC analysis of uterine wall thickness at different sites, and cervical length for predicting risk of preterm pregnancy

Table3: was showed that ROC curve analysis showed that anterior uterine wall thickness had significantly higher diagnostic accuracy than other parameters in predicting risk of preterm labor and the optimum cutoff for low anterior and mid anterior uterine wall thickness was 5.51 and 5.52 (mm) for predicting risk of preterm labor with sensitivity 58% of both markers and specificity 90% and 92%; respectively. Also, fundal thickness and posterior uterine wall thickness had cutoff values of 5.615, and 5.735 (mm); respectively with sensitivity 60% and 58% and specificity 88% and 86% of both markers respectively. While the cut off value of cervical length was 25.5 (mm) for predicting risk of preterm labor, the sensitivity was 62%, specificity was 76%

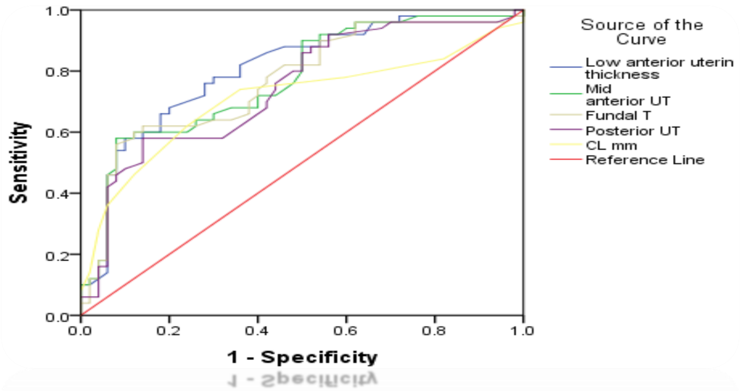

Figure 1: ROC curve of uterine wall thickness, and cervical length for predicting risk of preterm pregnancy

DISCUSSION

The studied cases have been divided into 50 pregnant women who have risk factors of preterm labor and 50 pregnant women without risk factors for preterm birth. There was statistically significant decrease in gestational age at delivery in cases with risk factors for preterm labor (mean was 35.7 ± 1.76 weeks) than in those without risk factors for preterm birth (mean was 37.88 ±1weeks) (P<0.001). There was no statistically significant difference among both studied groups with respect to the mean age of pregnant women (P=0.225), prior parity (P =0.494), mean BMI (P =0.261).

Experience of prior preterm birth was acknowledged as the most significant risk factor for PTB. This was in line with the former findings where women with previous PTD were at increased risk in their next pregnancy.[6, 7]

Preterm was the largest direct trigger of neonatal mortality and may be concomitant with severe morbidity in the surviving infants.[8]

There is a consensus that preterm neonates are at higher risk of NICU admission, prerequisite for oxygen therapy, hypoglycemia, neonatal demise and other neonatal morbidities when contrasted to full term counterparts. Neonatal mortality was reported to be around 2.3 times higher in 37 weeks paralleled to 39 weeks neonates. The American College of Obstetricians and Gynecologists (ACOG) reinforced on the significance of delaying, when feasible, the elective resolution of pregnancy to after 39 weeks, instead of intervening at 37 or 38 weeks.[9, 10]

Furthermore our results revealed that CL was shorter in cases who had risk of preterm labor (24.84± 3.19 mm) compared to that of those without risk (26.8±1.98 mm) (P <0.001). While the cut off value of cervical length was 25.5 (mm) for anticipating the risk of preterm labor, the sensitivity was 62%, specificity was 76%. However, the mean UCA and inner to inner cervical diameter (mm) showed no statistically significant difference among both studied groups (P >0.05).

Shazly et al.[11] reported that the average CL in preterm group was 3.1 mm while it was 4.6 mm in the term group 2 with a significant discrepancy between both groups (p=0.021). They stated that the most noteworthy indicator discriminating women with PTD from those who delivered at term was the overall aberrant cervicometric results.

Mabrouk et al.[2] revealed that, the predictive role of CL measurement evaluated by the ROC curve between 20 to 24 weeks at cut off value of < 26 mm had sensitivity 100%, 48.9% specificity with 54% accuracy.

The sensitivity and specificity of CL measurement of 25 mm in low risk women was estimated in Dalili et al.[12] study were 55.5% and 93.6% respectively.

PTB is hard to be predicted. Up till now, there are no strict and absolute standard parameters for its anticipation, but there has been substantial interest in ways of distinguishing at-risk women of giving birth prematurely via clinical symptoms & signs, biochemical indicators, as well as CL.[13]

In the PTB prediction, the prominent sonographic variable beyond a doubt is the CL since short cervix has been ascertained to be meticulously concomitant with an increased PTB risk. Though the procedure for measuring CL is unchanged in most studies, considerable variances were present, explicitly; definition and PTB criteria exhibit great variability among studies. Next, most of the CL measurements were performed at admission but not after tocolysis.[14]

However, universal CL screening of singleton gestations without a prior PTB history is still a matter of debate.[15, 16]

A published meta-analysis of randomized controlled trials (RCTs) did not find satisfactory evidence to advocate for or against routine CL screening, basically owing to limitations in the methodology of the included trials.[17]

For ease of clinical utility, 25 mm has been elected as the "cut-off" beyond which a cervix can be considered as normal, and underneath which it can be called as short and may be indicative of PTB. Women with a CL <25 mm and contractions have twofold incidence of PTB than women with a CL < 25 mm but no contractions.[18]

Mabrouk et al.[2] found that the CL estimated at 20-24 weeks in preterm group was significantly shorter in spontaneous PTB (sPTB) women in contrast to women who gave birth at full term.

Numerous additional ultrasound indicators have been studied to determine the risk of PTD, including cervical canal dilation, membrane distinguishability, gland area appearance, perfusion of the lower uterine segment, and if the canal was straight or curved. Regrettably, the data did not support any of these markers in the same way that our results did.[19]

There is some confirmation, that a wider UCA is allied to PTB before 34 weeks of gestation. Daskalakis et al.[20] assessed the existing body of literature about 3,000 women. The authors determined that 2nd trimester UCA measurements could be a beneficial measurement in the likelihood of PTB prior to 34 weeks. The most frequently reported cut-off measurements were 105° and 95°.

In agreement to our results earlier prospective cohort analysis that studied threatened PTL between the 20th and 31st weeks reported an average UCA of 103 degrees without statistically significant difference from the term group (P = 0.924).[21]

Our study showed the mean thickness of both lower anterior and mid anterior uterine wall was significantly thinner in women with risk of preterm labor than those without (5.42±0.49 (mm) vs. 5.88±0.36 (mm)), (P<0.001) & (5.45±0.49 (mm) vs. 5.89±0.37 (mm) respectively) (P<0.001).Furthermore, there was statistically significant decrease in fundal thickness and posterior uterine wall thickness in women with risk of preterm delivery than those without risk (5.48±0.47 vs. 5.9±0.37, and 5.6 ± 0.46 vs. 6.01 ± 0.38 mm; respectively) (p<0.001).). All uterine wall thickness as well as cervices length had statistically significant positive correlation with gestational age at delivery (P<0.001), neonatal birth weight (P<0.001), and negative correlation with inter pregnancy intervals less than 18 months (P<0.05). Finally, statistically significant negative correlation was observed between cervices length and each of NICU admissions more 2 weeks (r=-0.293, P=0.003), as well as RDS (r=-0.248, P=0.013).

ROC curve showed that the optimum cut-off values for low anterior and mid anterior uterine wall thickness were 5.51 and 5.52 (mm) for predicting risk of PTD with sensitivity 58% of both markers and specificity 90% and 92%; respectively (P<0.001). Also, fundal thickness and posterior uterine wall thickness had cutoff values of 5.615, and 5.735 (mm); respectively with sensitivity 60% and 58%

and specificity 88% and 86% of both markers respectively. There is a paucity of studies regarding correlation between uterine wall thickness evaluated via trans-abdominal ultrasonography and prediction of PTD.

Woraboot et al.[4] reported that where trans-abdominal ultrasonography (TAUS) was performed to estimate the lower uterine wall thickness (LUS) and TVUS was performed to measure the CL in 166 singleton pregnant women, an extremely positive correlation between LUS with cut-off value was 4.4 mm, and CL at 16-32 weeks of gestation (rs ¼0.767, n¼166, p<0,001). So they believed that it's practical to imply that when the cervix is found long, the lower uterine wall would be thick, and when the cervix becomes shorter, the lower uterine wall would transform in the same direction i.e. becomes thinner.

Mabrouk et al.[2] reported that there was statistically significant decrease in mean thickness of lower anterior in addition to mid anterior uterine wall, fundal and posterior wall thickness in women at risk of PTD than those without. Nonetheless, their study showed that there were no significant differences in myometrium thickness in diverse locations between cases at risk of preterm and the non-risky group. Using ROC curve, they reported that a posterior uterine thickness ≤6.0 mm had highest diagnostic characteristics in predicting preterm delivery among risky group with sensitivity 84.6%, specificity 62.2% and with 68% accuracy.

While Sfakianaki et al.[22] study, assessed myometrium thickness (MT) serially in 92 twin pregnant females to establish pregnancy outcomes via TAUS they reported that patients with LUS-MT thickness in 2nd trimester of (4.5 mm – 6.0 mm) were delivered at full term after 35 week' gestation, while patients with LUS-MT thickness of (3.5 mm-5.6 mm) had PTD before 35 week' gestation. Hamdi et al.[23] found that MT of the upper uterine segment continues as constant in the first and second pregnancy trimesters, while a significant linear tendency was found between thinning of the LUS and progressing gestational age.

Kim et al.[24] in the 2nd trimester, uterine wall thickness displayed that with the cut-off value of above 4.6 cm in uterine wall thickness, the sensitivity, specificity were 57.1%, 86.1% respectively. When they evaluated the diagnostic performance of uterine wall thickness in the 1st and 2nd trimester, uterine wall thickness in the 2nd pregnancy trimester exhibited significantly greater area under the curve (AUC) value for prediction of the subsequent PTD (p = 0.007).

Erzincan et al.[14] studied the fundal, mid-anterior walls MT estimated trans-abdominally and the LUS as well as CL measurements and the ratio between them to distinguish and recognize the at-risk cases for PTB following an experience of threatened PTB in 46 singleton pregnancies. In line to our work, they concluded that the optimal cut-off values for CL, fundal MT: CL and mid-anterior MT: CL ratios in anticipating PTB were estimated to be 31.1 mm, 0.19 and 0.20, respectively. They also reported that fundal MT: CL ratio predicted PTD with 71% sensitivity, 72% specificity values. For mid-anterior MT: CL ratio, sensitivity & specificity values were 76% for both. They found that fundal MT: CL and mid-anterior MT: CL ratios can anticipate PTB. They recommended that besides CL measurement, a fundal MT: CL ratio < 0.19 or mid-anterior MT: CL ratio < 0.20 can be used as an outpatient setting. This proofs our result in probability of expectation of PTL MT measurement via TAUS.

Elnasr et al.[5] in their recent work showed that there was a statistically significant positive correlation between CL and LUS assessed trans-vaginally in preterm labor prediction in twin pregnancies with 4.26 mm was their reported cut-off value for LUS.

Thereby, the uterine wall thickness during pregnancy can be considered as predictors for PTB.

CONCLUSION

The lower uterine wall thickness measured trans-abdominally could be utilized with the intention of predict cases at-risk for PTB. It may represent an effective, precise, appropriate, and harmless procedure in anticipating the preterm labor with high validity than cervical length, so further research in this sector is necessary to validate the findings, as there are currently no large-scale prospective randomized trials to verify their practicality.

Conflict of interest : none

REFERENCES

1. Sureshbabu, R. P., Aramthottil, P., Anil, N., Sumathy, S., Varughese, S. A., Sreedevi, A., & Sukumaran, S. V, Risk Factors Associated with Preterm Delivery in Singleton Pregnancy in a Tertiary Care Hospital in South India: A Case Control Study. *International Journal of Women's Health*. 2021; 13, 369-77.
2. Mabrouk, A. A., Kassab, F. A., & Mira, I. M, Role of Ultrasonographic Evaluation of Cervical Features and Myometrial Thickness in Prediction of Preterm Birth. *Al-Azhar International Medical Journal*. 2020; 1(1), 277-82.
3. Andrade, K. C., Bortoletto, T. G., Almeida, C. M., Daniel, R. A., Avo, H., Pacagnella, R. C., & Cecatti, J. G, Reference ranges for ultrasonographic measurements of the uterine cervix in low-risk pregnant women. *Revista Brasileira de Ginecologia e Obstetrícia*. 2017; 39, 443-52.
4. Woraboot, W., Wanitpongpan, P., & Phaophan, A, Correlation between lower uterine wall thickness measured by transabdominal ultrasonography and cervical length measured by transvaginal ultrasonography in Thai pregnant women. *Journal of the Chinese Medical Association*. 2019; 82(1), 50-4.
5. Elnasr, I. S., & Ammar, H. The Diagnostic Value of Cervicovaginal and Serum Ferritin in Relation to Spontaneous Preterm Birth: Observational Study. *The Egyptian Journal of Hospital Medicine*.2020; 79(1), 497-502.

6. Di Renzo, G. C., Giardina, I., Rosati, A., Clerici, G., Torricelli, M., Petraglia, F., & Italian Preterm Network Study Group, Maternal risk factors for preterm birth: a country-based population analysis. *European Journal of Obstetrics & Gynecology and Reproductive Biology*. 2011; 159(2), 342-6.

7. Khalajinia, Z and Jandaghi, G. Maternal risk factors for preterm birth: a country-based population analysis. *European Journal of Obstetrics & Gynecology and Reproductive Biology.* 2012;159, 342–6.

8. Reicher, L., Fouks, Y., & Yogev, Y, Cervical Assessment for Predicting Preterm Birth—Cervical Length and Beyond. *Journal of Clinical Medicine.* 2021; 10(4), 627-34.

9. Leal, M., Esteves-Pereira, A. P., Nakamura-Pereira, M., Domingues, R. M. S. M., Dias, M. A. B., Moreira, M. E., & da Gama, S. G. N, Burden of early-term birth on adverse infant outcomes: a population-based cohort study in Brazil. *BMJ open.*2017; 7(12), e017789.

10. Souza, R. T., Costa, M. L., Mayrink, J., Feitosa, F. E., Rocha Filho, E. A., Leite, D. F., & Cecatti, J. G, Perinatal outcomes from preterm and early term births in a multicenter cohort of low risk nulliparous women. *Scientific reports*. 2020; 10(1), 1-11.

11. Shazly, S. The Role of Ultrasound Cervical Assessment in Prediction of Preterm Labor. *Benha Medical Journal.* 2020; 37(3), 586-95.

12. Dalili, M., Meybodi, M. A. K., Ghaforzadeh, M., Farajkhoda, T., & Vardanjani, H. M. E, Screening of preterm labor in Yazd city: transvaginal ultrasound assessment of the length of cervix in the second trimester. *Iranian Journal of Reproductive Medicine.*2013; 11(4), 279-84.

13. FIGO Working Group on Good Clinical Practice in Maternal–Fetal Medicine, Di Renzo, G. C., Fonseca, E., Gratacos, E., Hassan, S., Kurtser, M., & Tosto, V, Good clinical practice advice: rediction of preterm labor and preterm premature rupture of membranes.. *International Journal of Gynecology & Obstetrics.* 2019; 144(3), 352-5.

14. Erzincan, G. S., Sayin, N. C., Korkmaz, S., Sutcu, H., Inan, C., Uzun Cilingir, I., & Varol, F. G, Can myometrial thickness/cervical length ratio predict preterm delivery in singleton pregnancies with threatened preterm labor? A prospective study. *Archives of gynecology and obstetrics*. 2019; 299(5), 1275-82.

15. Parry, S., Simhan, H., Elovitz, M., & Iams, J, Universal maternal cervical length screening during the second trimester: pros and cons of a strategy to identify women at risk of spontaneous preterm delivery. *American journal of obstetrics and gynecology.* 2012; 207(2), 101-6.

16. Khalifeh, A., & Berghella, V. Universal cervical length screening in singleton gestations without a previous preterm birth: ten reasons why it should be implemented. *American Journal of Obstetrics and Gynecology.*2016; 214(5), 603-e1.

17. Berghella, V., & Saccone, G. Cervical assessment by ultrasound for preventing preterm delivery. *Cochrane database of systematic reviews.* 2019; (9), CD007235.

18. O'Hara, S., Zelesco, M., & Sun, Z, Cervical length for predicting preterm birth and a comparison of ultrasonic measurement techniques. *Australasian journal of ultrasound in medicine.* 2013; 16(3), 124-34.

19. Wagner, P., Schlechtendahl, J., Hoopmann, M., Prodan, N., Abele, H., & Kagan, K. O, Measurement of the uterocervical angle for the prediction of preterm birth in symptomatic women. *Archives of Gynecology and Obstetrics.* 2021; 304(3), 663-9.

20. Daskalakis, G., Theodora, M., Antsaklis, P., Sindos, M., Grigoriadis, T., Antsaklis, A., & Pergialiotis, V, Assessment of uterocervical angle width as a predictive factor of preterm birth: a systematic review of the literature. *BioMed research international.*2018; 1837478.

21. Gründler, K., Gerber, B., & Stubert, J, Uterocervical angle as a predictor of preterm birth on a high-risk collective between 20 and 31 weeks of gestation: A cohort analysis. *Acta Obstetricia et Gynecologica Scandinavica.* 2020; 99(11), 1527-33.

22. Sfakianaki, A. K., Buhimschi, I. A., Pettker, C. M., Magloire, L. K., Turan, O. M., Hamar, B. D., & Buhimschi, C. S, Ultrasonographic evaluation of myometrial thickness in twin pregnancies. *American journal of obstetrics and gynecology.* 2008; 198(5), 530-e1.

23. Hamdi, K., Bastani, P., Saheb-Madarek, E. O., & Hosseini, H, Prediction of latency interval in preterm premature rupture of membranes using sonographic myometrial thickness. Pakistan journal of biological sciences: *PJBS*. 2010; 13(17), 841-6.

24. Kim, Y. M., Kim, S. H., Kim, J. H., Sung, J. H., Choi, S. J., Oh, S. Y., & Roh, C. R, Uterine wall thickness at the second trimester can predict subsequent preterm delivery in pregnancies with adenomyosis. *Taiwanese Journal of Obstetrics and Gynecology.*2019; 58(5), 598-603.