Cervical Length at Mid-Trimester in Thai Women with Normal Singleton Pregnancies

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ABSTRACT

Objective: To establish a normal value of cervical length at mid-trimester of Thai women with normal singleton pregnancies and to define the cutoff value of short cervix in Thai population.
Methods: An observational study was carried out including 1,027 women whose cervical length were measured by transvaginal ultrasonography during 20-24 weeks of gestation. Those who had risk factors of preterm labour or delivered before 37 weeks were excluded.
Results: Mean cervical length of nulliparous, multiparous women and overall population were 40 (29.4-49.2) mm, 42.1 (31.9-54) mm and 41 (30.6-52) mm respectively ($p<0.001$). Short cervix, defined as less than 5 percentile of normal value, in overall population was 30.6 mm.
Conclusion: The cervical length of pregnant Thai women is a little longer than previously reported and this new cutoff value should be studied to assess its accuracy in prediction of preterm labour in Thai population.

Keywords: Cervical length, short cervix, preterm labour, Thai pregnant women

INTRODUCTION

Preterm labour (PTL) is one of the major problems in modern obstetrics and is still the leading cause of perinatal morbidities and mortalities worldwide. The incidence has been stable or even increasing despite many vigorous preventive efforts. Some risk factors have been found to be associated with PTL, but many women delivered prematurely without any known risk factors.[1-3] Cervical length (CL) has been believed to be the strongest predictor for PTL and there are many recommendations to measure CL in both low risk and high risk pregnant women.[4-7] Cervical length, like many other medical parameters, can have ethnic variations and reference values of one's own ethnic group could be more relevant and reliable. We therefore, conducted a study to establish the cervical length value of normal Thai pregnant women during mid-gestation and to obtain the cutoff value of short cervix for screening and prevention of PTL in the future.

MATERIALS AND METHODS

We conducted an observational study between 2008 and 2009. Thai pregnant women without any risk factors of PTL who booked for antenatal care at Siriraj Hospital were invited to participate the study. The study was approved by institutional ethical committee and all participants

gave their written informed consent. Inclusion criteria were Thai women with singleton pregnancy, known correct gestational age and delivered at or more than 37 weeks. Exclusion criteria were multiple pregnancy, had risk factors of PTL or CL at mid-gestation was unavailable. The gestational age was determined by either correct menstrual history or ultrasonography before 20 weeks. CL was obtained at mid-gestation (20-24 weeks) by transvaginal examination using 7.5 mHz vaginal probe attached to Voluzon E8 ultrasound platform (GE Medical, Kretztechnik GmbH, Austria). The patients were placed in lithotomy position after emptying the bladder. The sagittal view of the cervix was obtained and measurement of CL (between external os and internal os) was made in linear fashion by a single operator (P W) to avoid technique and interobserver variation. Caution was applied to not exert too much pressure on the cervix and to not include the vaginal fornix during measurement which would make the cervix longer than usual. (Fig 1, 2) The CL was measured three times and the shortest value was recorded. Statistical analysis of CL was made by SPSS version 18.0 (SPSSInc, Chicago, IL, USA) to get mean and 5th, 10th, 90th and 95th percentile values of CL. The student t-test was used to compare CL of nulliparous and multiparous women to detect any differences between groups. We also assessed intraobserver variation by randomly retrieving 50 pictures of the cervix from restored data for re-measurement and intraclass correlation coefficient (ICC) was calculated. The outcomes of pregnancy were recorded and those who delivered before 37 weeks were excluded from this study.

RESULTS

1,027 singleton pregnant women were enrolled in the study and only 832 were included for statistical analysis (453 nulliparous women and 379 multiparous women). Demographic data of the participants has been presented in Table 1. CL of nulliparous women, multiparous women and overall population have been shown in Fig 3. Mean CL of nulliparous, multiparous women and overall population = 40 (29.4-49.2) mm, 42.1 (31.9-54) mm and 41 (30.6-52) mm respectively
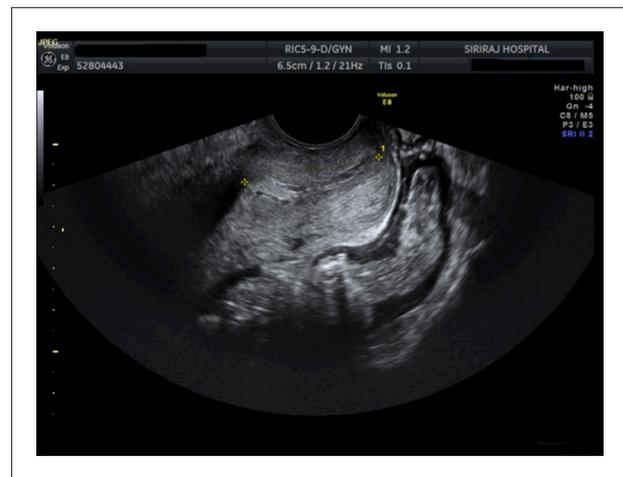
Fig 1. The picture showed correct measurement of the cervical length from internal os (left marker) to external os (right marker) in linear fashion.
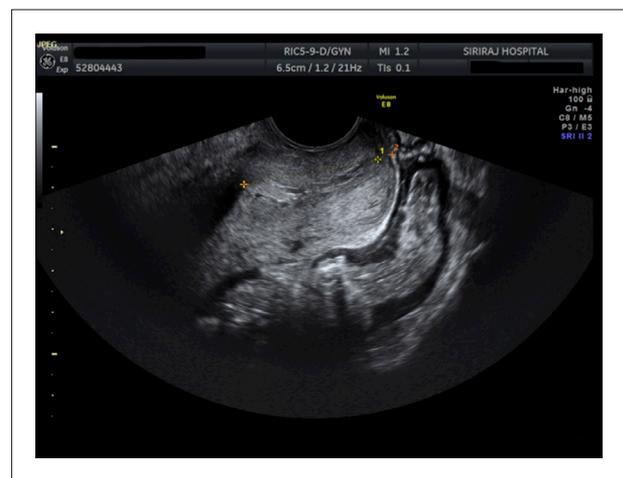
Fig 2. The picture showed correct measurement (yellow line) of CL compared with the incorrect measurement (orange line) that included the vaginal fornix.
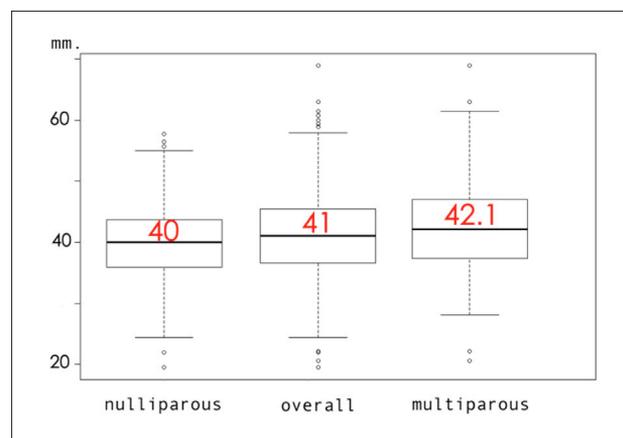
Fig 3. Interquatile range of CL in nulliparous, multiparous women and overall population at 20-24 weeks of gestation.

TABLE 1. Basic information of participants.

Parameter	
Age (yrs)	26.8 (15-44)
Parity : nulliparous	453
1	289
2	79
3	9
4 or more	2
GA at CL measurement (wks)	22.8 (20-24)
GA at birth (wks)	39 (37-42)
Birth weight (g)	3,130 (2,010-4,860)

Note: GA = gestational age, CL = cervical length, wks = weeks

(p<0.001). The CL at 5th and 10th percentiles of normal value were set as cutoff values of short cervix and the values were 29.4 mm and 32 mm for nulliparous women and 31.9 mm and 33.8 mm for multiparous women respectively. The value in overall population was 30.6 mm and 32.7 mm respectively. ICC showed high correlation (r = 0.92).

DISCUSSION

Our study found that the mean CL of Thai nulliparous women is a little shorter than that of multiparous women. Most previous studies showed that the cervix of multiparous women is longer or comparable with nulliparous women, but not shorter.[6,8-10] This finding could be a proof that natural remodeling process of the cervix after delivery is really effective and can restore the cervical structures back to pre-pregnancy condition. Also our finding was against some long-held beliefs that the cervix of multiparous women is shorter due to the destruction of collagenous structures of the cervix after effacement and dilation during delivery. Although the difference was statistically different, we don't think that 1-2 mm difference will be clinically significant, because the difference was trivial and could result from minute measurement error. The mean CL of Thai women corresponds with other studies in Asian population and seems to be a little longer than previous reports in Caucasian population.[5-6,9,11] One reason for this is many studies which re-

ported the 25 mm as a cutoff value to define short cervix were conducted in both low risk and high risk populations, not just in normal women who delivered at term. There could be some subjects that had short cervix and delivered prematurely included in those studies which resulted in shorter mean CL and 10th percentile CL value. The other possible reason is the ethnic variation that Asian women have longer cervix as noted in many other studies conducted in Asian populations.[9-11] We believe that our own cutoff value of short cervix (30 mm; 5th percentile) should be used as an important predictor of PTL in Thai pregnant women because it is possible that using 25 mm or 15 mm as a cutoff value of short cervix might be too late to detect the patients with early parturition and because those who have already entered the preterm labour process might not respond that well to following interventions. Further study using this new cutoff value should be conducted to gain more information in predicting PTL in Thai population.

The strengths of our study were a large sample size and measurement of CL by a single operator. The limitation of this study was the lack of CL at different gestational ages which was recently reported to have a different risk of PTL. Future studies may provide more informative data about this and prevention of PTL could be improved.

CONCLUSION

The cervical length of normal Thai pregnant women is a little longer than previously reported and this new cutoff value should be studied to assess its accuracy in predicting preterm labour in Thai population.

ACKNOWLEDGMENTS

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