

TRANSVAGINAL SONOGRAPHY AND CERVICAL LENGTH CHANGES IN NORMAL PREGNANCY

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ABSTRACT

Objective: Transvaginal sonography (TVS) is the gold standard for investigating cervical length. The aim of this study was investigation of cervical length changes during normal pregnancy by TVS.

Methodology: This epidemiological study was carried out from 22nd April 2006 to 21st April 2007 on 150 pregnant women who had contacted Ahwaz Imam Khomani Hospital. Cervical length changes in normal pregnancies were studied by TVS in three trimesters. Gestational age of studied population was 8 to 37 weeks. Anova and Chi Square tests were used for statistical analysis.

Results: In the 2nd trimester the cervical length was at minimum (26mm) and mean cervical length was (40.72 mm). In the 1st trimester cervical length was the maximum of (56 mm) and mean cervical length was (39.03 mm). Mean cervical length was the shortest (37.83 mm) in the under 20 years and longest (40 mm) in the over 35 year's age group.

Conclusion: Transvaginal Sonography is useful, for cervical length evaluations and management of preterm deliveries and cervical insufficiency.

KEY WORDS: Transvaginal sonography, Cervical length, Normal pregnancy.

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INTRODUCTION

During pregnancy, cervix has an important role in keeping fetus and preventing early delivery.¹ Detection of cervical shortening or widening and management of cervical insufficiency in early deliveries are very important.² Also shortening of cervical length increases preterm delivery risk.³

At present, transvaginal sonography is very important in diagnosis of cervical insufficiency⁴ and in comparison with abdominal or perineal sonography is a safe and acceptable method for cervical investigation.^{3,5} It is the gold standard for cervical investigation.^{6,7} Transvaginal sonography showed that in patients who had delivery at term, the cervical length was fixed during the first 30 weeks, but shortens progressively in the third trimester.⁸

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Table-I: Cervical length in 3 trimesters

<i>Duration of pregnancy(weeks)</i>	<i>Number</i>	<i>Mean (millimeter)</i>	<i>Minimum (millimeter)</i>	<i>Maximum (millimeter)</i>
8-14	51	39	28	56
15-28	51	40.7	26	52
29-37	48	39.3	27	52

Cervical length is almost fixed during the first 16 weeks of pregnancy, then shortens gradually by term⁸ and there is an inverse relationship between cervical length and early delivery.⁹ In one study, cervical length was measured in the 24th and 28th weeks of pregnancy and showed that women whose cervical length were progressively shortened, had greater risk of preterm deliveries.⁴ In another study, cervical length was investigated in two groups of parturients who had full term or preterm deliveries which was carried out by transvaginal sonography and mean cervical lengths were measured as 32 and 18mm respectively.¹⁰ In yet another study cervical length was measured during weeks 11-14 and then weeks 14-22 and showed that cervical length during weeks 11-14 in term and preterm deliveries was equal while during weeks 22-24 in preterm deliveries it was shorter.

Therefore, as shortening of cervical length increases preterm delivery risk, clinical evaluation of patients with proved cervical insufficiency (cervical length measuring by transvaginal sonography) is necessary.³

METHODOLOGY

This study was carried out from April 20th 2006 to April 19th 2007. During that time 150 parturient who entered Ahwaz Imam Khomani Hospital were enrolled in the study. Cervical length changes were evaluated during normal pregnancies in three trimesters (about 50 women in each trimester) by one radiologist transvaginal sonographically. Gestational age in our population was 8-37 weeks. Cases with multiple pregnancies, history of dilatation and curettage, cervical anomalies, early delivery and cerclage were

excluded from the study. Patients were divided into three age groups of less than 20 years old, 20-35 years and more than 35 years old. Descriptive statistics tables, Anova and Chi Square tests were used for analysis. All patients were explained about study details and they gave their consent for participation in this study.

RESULTS

As shown as Table-I, during the 2nd trimester, cervical length was minimum (26mm) and mean cervical length was maximum (40.72mm) while cervical length was maximum (56mm) and mean cervical length was minimum (39.03mm) during the 1st trimester. Table-II, shows that cervical length less than 50mm was the most common and cervical length less than 30mm was the least common, in each trimester. Cervical length in delivery types is shown in Table-III. The majority of studied population (98) and the minimum

Table-II: Distribution of cervical length in 3 trimesters

<i>Duration of pregnancy (weeks)</i>	<i>Cervical length (millimeter)</i>	<i>Percentage of frequency</i>
8-14	<30	3.9
	<40	56.9
	<50	94.1
15-28	<30	9.8
	<40	37.3
	<50	88.2
29-37	<30	4.2
	<40	54.2
	<50	93.8

Table-III: Cervical length based on the previous deliveries

Type of delivery	Number	Mean (millimeter)	Minimum (millimeter)	Maximum (millimeter)
Normal delivery	26	41.9	29	56
Cesarean section	26	39.5	28	52
Nullipar	98	39.1	26	52

cervical length were seen in nulliparas and the maximum cervical length was seen in normal delivery. Age groups are shown in Table-IV. Age groups of less than 20 years old and 20-35, had the minimum cervical length while 20-35 age groups had the maximum cervical length. Mean cervical length of minimum and maximum were in less than 20 years old age group (37.83mm) and more than 35 age group (40mm) respectively. Mean cervical length according to parity was evaluated which showed that in women with parity one and more than parity one the mean cervical length were 38.49 and 40.79mm, respectively.

DISCUSSION

Cervical length was investigated during three trimesters which showed that the maximum cervical length was observed in the 1st trimester but from statistical point of view there was no significant difference between three trimesters ($P=0.38$). In one survey cervical length in weeks 8-37 was investigated by transvaginal sonography and showed the maximum cervical length during weeks 20-25¹¹ which does not correspond to our findings. In another study it was shown that cervical length does not vary considerably.¹² Cervical length in the first 16 weeks of pregnancy is almost fixed and then shortens gradually by term⁸ which corresponds with the findings of our study. Also the

mean cervical length in three age groups was evaluated and no significant difference was found ($P=0.77$).

In one study it was found that the age had no effect on the cervical length¹³ and this point correlates with our study. Mean cervical length was investigated according to parity and which showed it was longer in multiparas than nulliparas and the difference had a significant statistical meaning ($P=0.03$). In yet another study it was clear that cervical length is longer in multiparas than women with parity one, who had cesarian section before or had 1st trimester abortion¹² which agrees with our findings.

Another study showed cervical length has no significant difference between multiparas and nulliparas^{14,15} which does not agree with our study. According to the delivery types, cervical length was investigated and no significant difference was seen ($P=0.18$). In one survey it was found that delivery types had effect on cervical length which is not evident from our findings.¹²

In this study 150 pregnant women during normal pregnancy were investigated and the results of previous studies about the effects of gravity and parity on cervical length were confirmed. Transvaginal sonography in investigation of cervical length, detection and management of preterm delivery and cervical insufficiencies was found quite useful.

Table-IV: Cervical length in different age group

Age groups(year)	Number	Mean (millimeter)	Minimum (millimeter)	Maximum (millimeter)
<20	6	37.8	26	46
20-35	135	39.7	26	56
>35	9	40	29	50

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