CERVICAL MEASUREMENTS IN NORMAL PREGNANCY BY ULTRASOUND

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SUMMARY

The knowledge of cervical dimensions in normal pregnancy at various periods of gestation is extremely important for early diagnosis of incompetent cervix. A prospective study in 100 pregnant women was done to evaluate the cervical measurements namely, length of cervical canal. Width of internal os and thickness of anterior wall of lower uterine segment (LUS); and the findings corelated with foetal outcome.

Ninety two women who delivered at term had a mean cervical length varying from 4.81 - 4.2 cms at 10 to 28 weeks of gestation. Mean diameter of internal os was.4 - .9 cm and average thickness of anterior wall of LUS varied from 1.03 - .8 cms.

INTRODUCTION

The Grey Scale ultrasonography is a useful tool in defining cervical anatomy and has been used in diagnosing cervical incompetence. (Vaalamo and Kiviski 1983, Ludmi 1988). Present study was undertaken to establish normograms of cervical dimensions in pregnancy at different gestational ages and to document parameters of cervical incompetence.

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MATERIAL AND METHODS

A total of 100 cases after ruling out high risk factors for preterm labour were selected for study from the antenatal clinics and wards of UCMS & GTB over a period of 20 months from Feb. 1989 to Sept. 1990. The first ultrasound examination was performed at 10 weeks gestation followed by subsequent scans at 4 weekly interval. Cervical length, width of internal os, thickness of anterior wall of LUS were measured. These patients were followed till term and foetal outcome noted.

Transabdominal sector scanner was used. (3.5 MH_Z) . Patients were called with partially filled bladder. Serial scans were performed longitudi-

nally above the pubic area at 5mm interval. Cervical canal was identified as a hypoechoic line from the internal os to vaginal plate. The scan was adjusted to visualise the entire length. Measurements were made using a digital caliper. The base of the internal os was identified as the apex of membrane U formation covering the cervix. If the length was not clearly defined a mean of 3 readings was taken. Width of the cervical canal was noted at the level of internal os and the thickness of anterior wall of LUS was measured at the vertical limb of internal os. All these parameters were ultimately corelated with pregnancy outcome.

RESULTS

Cervical length in normal pregnancy varied from 4.81 cm - 4.2cm at various gestational ages. There was no statistically significant correlation between the length and increasing gestational age. No case had a length of less than 3 cm at any period of gestation. Parity had no effect on antenatal cervical length (Table - I, Fig. I.).

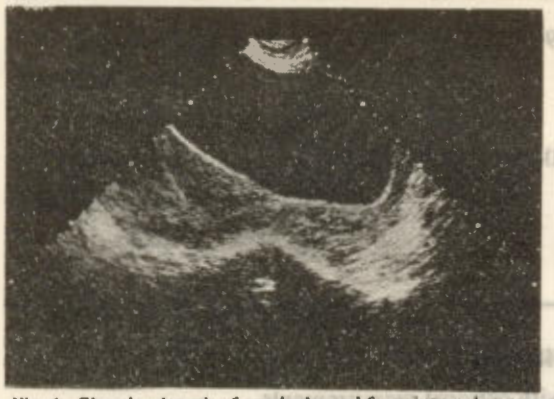

Fig. 1 : Showing length of cervical canal from internal os to vaginal plate. L 6.7 cm.

Width of cervical canal at internal os ranged between .4 - .9cm. Ultrasonographic evaluation of cervical width did not show any variation with gestational age. (Table I Fig. II) Thickness of anterior wall of LUS could be measured in all, except cases of anterior placenta previa (N=10) early gestation (N=4) Protruding membranes (N=3) and scarred - Uterus (N=2). There was gradual thinning of lower segment with increasing gestational age. Average thickness ranged from 1.03-.8 (Table I. Fig. II).

Ninety two cases with normal ultrasound parameters delivered at term. Six patients had preterm deliveries and 2 were lost to follow up (Table - II).

Fig. 2 : Showing width of the internal os thickness of anterior wall of LUS. .6 cm, .7 cm

DISCUSSION

The study of various parameters of the uterine cervix with ultrasonography may have potential use as a predictor of pregnancy outcome. Previous studies of ultrasonically measured cervical dimensions have had differing results. A mean length of 5cm until 34 weeks of gestation has been quoted by Ayres et al (1988). He stated a critical level of 4cm or shortening by half was associated with deleterious effects. Zemlyn (1981) observed a mean cervical length 3.7cm and 6cm as maximum length in normal pregnancy. Podobnik et al (1988) observed that a mean cervical length varied from 4.9 to 4.2cm at 10-36 weeks. They also observed that the difference in length was significant in two groups - namely 10-24 weeks (4.9-4.7cm) and 29-36 weeks (4.4cm)

We observed similar finding in our data. Anderson (1991) has shown normative data for cervical length by abdominal and transvaginal sonography. Mean length at similar periods of gestation range from 5.9 - 3.9 by trans abdominal method. Transvaginal sonography showed varia-

TABLE I

Cervical Parameters in normal pregnancy at various periods of gestation

Weeks of Gestation	10-14	15-20	21-26	>27
Length of cervix (cm) (N =100)	4.81	4.7	4.42	4.2
Width of OS (N=100)	0.61	0.58	0.9	0.49
Thickness of anterior wall of LUS	1.03 (N = 92)	0.946 (N=93)	0.8 (N=97)	0.8 (N=98)

TABLE II

Correlation of cervical diameters with pregnancy outcome.

Number of cases	Cervical Length cm (Mean)	Width (Mean) cm.	Thickness of Ant. Wall of cm. LUS (Mean)	Foetal outcome
92	4.2-4.71	.49-.9	.8-1.03	Delivered between 37-41 weeks
6	4.08-4.6	.40-.9	.72-.93	Delivered between 33-37 weeks
2	Lost to follow up			

TABLE III

Relationship of parity with cervical measurements

Parity	No.	Mean length (CMS)	No.	Mean width of OS (CMS)	No.	Mean Thickness of LUS (CMS)
Primigravida	37	4.3	37	0.46	32	0.9
Multigravida	63	4.18	63	0.68	56	0.73

tion from 4.1 - 3.2cm. In our study a cervical length varied from 3 cm to 7.6 with a mean length of 4.81 - 4.2 at various gestational ages.Mean width of internal os was .66 cm irrespective of gestational age. No significant difference was observed with increasing gestational age. However there was significant difference in the mean width of primi and multigravida (.46 vs .68 cm) (Table III).

Brook et al (1981) observed that a width of internal os upto 1.9cm was normal. Mehran (1980) reported that a measurement of less than 1.5cm in Ist trimester and 2cm in 2nd trimester was within normal limits while Varma et al (1986) found a cervical canal diameter upto .8cm as normal. Podobink et al (1988) have shown a mean width of internal os as .47 to .52 cm with no statistical difference with advancing gestational age.

The thickness of anterior wall of LUS has not been much studied. Isolated, this parameter is not a reliable indicator of predicting cervical competence; at best it is a supportive measurement. Our study shows obvious difference in thickness when compared with western figures .88 cm vs Podobnik et al's 1.8 - 1.7cm (1988). This may be explained by the poor socioeconomic status and hence poor nutritional status in our population.

CONCLUSION

This study was under taken so that institution could establish its criteria for cervical normograms. It helped to pick up cases which needed cervical cerclage. However a comprehensive study of all three measurements could predict the pregnancy outcome and avoid unnecessary cerclage because one parameter alone is not significant.

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